UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
BAKERSFIELD FIELD OFFICE
ENVIRONMENTAL ASSESSMENT

March 14, 2012 Oil and Gas Lease Sale
Environmental Assessment DOI-BLM-CA-C060-2011-0255

Chapter 1. Purpose and Need

PURPOSE AND NEED

The proposed action is to offer approximately 1,259.15 acres of Federal mineral estate for competitive oil and gas leasing. This action is intended to meet Bureau of Land Management (BLM) responsibilities under the Mineral Leasing Act of 1920, as amended, Mining and Minerals Policy Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act), to conduct competitive oil and gas lease auctions within the state of California.

BLM has the responsibility to conduct quarterly competitive oil and gas lease auctions in accordance with Section 5102(2)(1)(A) of the Reform Act. The Reform Act directs the BLM to conduct quarterly oil and gas lease auction within each state whenever eligible lands are available for leasing. BLM policy is to offer, as expeditiously as possible, those lands available for oil and gas exploration and possible development, consistent with the Federal Land Policy and Management Act (FLPMA) of 1976, National Environmental Policy Act (NEPA) of 1969, and other applicable laws, regulations, and policies.

The parcel descriptions in Appendix A will be re-parcelized for the Lease Sale Notice, which will combined parcels or create additional parcels. All parcels proposed for leasing are split-estate (private surface with Federal subsurface minerals). All parcels would be subject to special leasing stipulations that would protect both endangered species and sensitive species and their habitat, as well as cultural, tribal and paleontological resources.

This Environmental Assessment (EA) is tiered to the Caliente Resource Management Plan/Environmental Impact Statement (RMP/EIS) dated May 5, 1997. The RMP/EIS is the most current land use plan located in the BLM Bakersfield Field Office. A more complete description of activities and impacts related to oil and gas leasing, development, production, etc. can be found in Chapter 5, page 33 of the RMP. Whether specifically mentioned or not, standard operating practices in the oil field include measures to protect the environment and resources such as groundwater, air, wildlife, historical and prehistoric resources,and others (Appendix C).

This action is to conduct a competitive oil and gas lease auction. The BLM periodically conducts mineral estate lease auctions for lands that are managed by the federal government, whether managed by the Department of Interior (BLM, Bureau of Indian Affairs, Fish and Wildlife Service, Park Service), Department of Agriculture (Forest Service), or other Departments.

Federal Onshore Oil and Gas Leasing Reform Act of 1987 Sec. 5102(a)(b)(1)(A) (Reform Act) directs the BLM to conduct quarterly oil and gas lease auctions with each state whenever eligible lands are available for leasing. By conducting a lease auction of the Federal mineral estate, it provides for a potential increase of energy reserves for the U.S., it provides a steady source of significant income, and at the same time

meets the requirements identified in the Energy Policy Act, Sec. 362(2), Federal Onshore Oil and Gas Leasing Reform Act of 1987, and The Mineral Leasing Act of 1920, Sec. 17.

BLM Oil & Gas Leasing and Lease Management Federal Lands

BLM administers public land in accordance with the Federal Land Policy and Management Act (FLPMA) of 1976 and other laws. Sometimes public land includes the surface estate and the subsurface mineral estate, and sometimes it involves split estate where BLM controls either the surface or subsurface mineral estate but not both. BLM can lease public land including split estate lands where the surface estate is owned by another party. For parcels considered in this EA that are split estate, the lessee and/or operator would be responsible not only for adhering to BLM requirements, but also for reaching an agreement with the private surface landowner regarding access, surface disturbance and reclamation.

Four parcels are private surface overlying federal mineral estate, known as 'split estate'. The BLM has split estate guidance (Washington Instruction Memorandum No. 2003-131) and a recent Instruction Memorandum No. 2009-184, Courtesy Notification of Surface Owners When Split Estate Lands are Included in an Oil and Gas Notice of Competitive Lease Sale. This Instruction Memorandum establishes a BLM requirement to notify surface owners, as a courtesy to inform surface owners when their lands are included in a list of lands to be offered for competitive sale.

Parties filing an Expression of Interest (EOI) to offer lands at a competitive oil and gas lease sale are required to provide the BLM with names and addresses, including the Accessor Parcel Number of any surface owners where split estate lands are included in their EOI.

Review process

The phased approach for NEPA compliance has been determined by the Ninth Circuit Court of Appeals to be a valid method to comply with applicable laws and regulations (Ninth Circuit Court of Appeals, Northern Alaska Environmental Center et al *vs.* Kempthorne, 2006). In that decision, the Court said "Uncertainty is inherent in multi-staged projects and a phased analysis for both environmental and cultural (is appropriate)." At the leasing stage, a more generalized study is appropriate because it is not yet known which, if any, of the parcels will actually be developed, and the site specific analysis is more appropriately deferred to when development is proposed.

The Secretary of the Interior is responsible under the Mineral Leasing Act of 1920, as amended, for leasing and managing Federal oil and gas resources on public land. Acting for the Secretary, BLM has conducted ongoing oil and gas leasing activities for many years in the Bakersfield Field Office and throughout California.

The review process required before oil and gas drilling can occur is described in detail in Title 43 Code of Federal Regulations Part 3100 and BLM Manual 3100. In summary, BLM offers lands for oil and gas lease to the highest qualified bidder in a competitive auction. The lease term is 10 years, and for as long thereafter as oil and gas can be produced in paying quantities, and the maximum lease size offered by BLM is 2,560 acres, (see FOGRA of 1987 Sec. 5102(b)(1)(A)). BLM conducts and documents an environmental analysis at the lease issuance stage, unless an adequate analysis was included in an existing environmental document. Although most of the issues regarding oil and gas leasing on the lands covered by this document were addressed in previous documents, there are a few areas where either conditions have changed or else BLM policy has been modified, or both. Hence, this EA is tiered to the existing document previously discussed.

After obtaining an oil and gas lease and prior to drilling any well, a lessee and/or operator submits an Application for Permit to Drill (APD), indicating the specific location of the drilling site. BLM conducts

and documents additional environmental analysis at the APD stage. BLM may require reasonable mitigation measures in the APD, consistent with the lease terms and stipulations.

Directional drilling from adjacent land to a federal lease

On occasion, it may be desirable or necessary to drill a well from a surface location that is not directly above the drilling target. This is known as directional drilling. Even though the surface location may not be within the federal mineral lease, BLM has the authority to regulate drilling from adjacent, non-federal land if federal minerals are involved by requiring a drilling application. Such directional drilling is subject to applicable environmental laws, including National Environmental Policy Act (NEPA) of 1969, the National Historic Preservation Act of 1966 (as amended), and the Endangered Species Act (ESA) of 1973, as amended. BLM will process this type of application in the same manner as for an application on leased lands. On split estate lands where the surface is not federally owned, the surface owner may allow other activities to occur that are not related to the federal mineral estate. Those activities are not a direct or indirect result of the federal lease sale, nor are they reasonably foreseeable, and therefore are not part of this analysis.

Lease terms and stipulations

A lease for oil and gas gives a lessee (holder of the lease) the right to drill and produce, subject to the lease terms, any special stipulations, other reasonable conditions, and approval of an Application for Permit to Drill (APD). The regulations at 43 CFR 3101.1-2 define the reasonable measures which BLM can require of a lessee. These include, but are not limited to, moving the proposed drilling site up to 200 meters, delaying surface disturbance or drilling up to 60 days, or requiring special reclamation measures. Generally, the BLM cannot deny a lessee the right to drill once a lease is issued unless the action is in direct conflict with another existing law. Stipulations such as the Controlled Surface Use – Protected Species, Controlled Surface Use – Sensitive Species and No Surface Use (Appendix B) are appropriate where sensitive and significant values exist which could be impacted by development of the oil and gas lease.

Any surface disturbing activity requires prior approval of the BLM. Such approval would include a site-specific evaluation and compliance with NEPA requirements. Routine activities including, but not limited to, cleaning out wells, well tests, monitoring activities, repairing and maintenance of equipment, and routine workovers do not require BLM approval, but would require adherence to all applicable laws and regulations. For those parcels that are 'split-estate' (private surface overlying federal minerals), the BLM requires the lessee/operator to make a good faith effort to obtain an agreement with the private surface owner prior to access on the leased land issued through competitive bid.

Where the lessee/operator is unable to reach a surface use agreement with the private surface owner, the lessee/operator can file a surface owner protection bond. This bond should be in an amount sufficient to protect against damages to the surface as allowed in the statute that reserved the mineral rights to the Federal government. However, the minimum of the surface owner protection bond is $1,000.00.

Restoration Measures and Clean up Costs

All lessees/operators of an oil and gas lease are required to submit to the BLM proper bonding prior to any application for permit to drill (APD) approval. The bonding remains in place for as long as operations continue until final abandonment is complete and approved by the BLM. The range of the bond amount varies from $20,000 to $300,000. The bond serves to plug and abandon wells, clean up the leased area, surface restoration, and also to pay for any outstanding rentals or royalties due on the lease should the lessee/operator default on those obligations.

The Bakersfield BLM Office has a mechanism for tracking operations of oil and gas leases. The BLM has an inspection and enforcement team that frequently inspect leases and is effective in assuring that the

operations of leases are in compliance. These inspections include review on all well abandonments for proper reclamation.

The BLM is partnered with California Division of Oil, Gas, and Geothermal Resources (CDOGGR) for orphaned and idle wells. A Memorandum of Understanding (MOU) is in place that addresses these types of wells and what the responsibilities of the BLM are and those of the State Division of Oil and Gas.

The BLM currently has only one orphan well on Federal lands in California. The BLM and CDOGGR have a very active and successful Idle Well Management Program which helps prevent idle wells from being orphaned. The CDOGGR has an orphan well abatement fund which replenishes each year, and also has an acute orphan well abatement fund for emergency purposes. The CDOGGR is developing an orphan facilities fund. The BLM appropriates funds as required to perform the work. In the past, BLM has partnered with CDOGGR to abandon Federal orphan wells. The results of these programs have been very successful.

CONFORMANCE WITH BLM LAND USE PLANS

The 1997 Caliente Resource Management Plan RMP identifies all of these lands as open to oil and gas leasing, subject to certain environment controls indicated in the plan, Ch. 5 page 34. Consequently, this action is in conformance with the Plan. Most importantly, because every parcel is within potential threatened and endangered species and sensitive species habitat, all parcels would contain both Controlled Surface Use –Protected Species, and Controlled Surface Use – Sensitive Species stipulations. These stipulations would ensure through a site specific biota survey and NEPA analysis that all protected or sensitive species issues were addressed prior to any surface disturbance. Additional stipulations for the protection of known, as well as unrecorded cultural and paleontological resources are also required. This would ensure protection of the resources and also provide notification to the lessee that further consultation and mitigation/compensation might be necessary prior to authorization of surface disturbance.

RELATIONSHIP TO STATUTES, REGULATIONS AND OTHER PLANS

BLM has responsibilities under the Mineral Leasing Act of 1920, as amended, Mining and Minerals Policy Act of 1980, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act), to conduct competitive oil and gas lease auctions within the state of California.

BLM has the responsibility to conduct quarterly competitive oil and gas lease auctions in accordance with Section 5102(2)(1)(A) of the Reform Act. The Reform Act directs the BLM to conduct quarterly oil and gas lease auction within each state whenever eligible lands are available for leasing. BLM policy is to offer, as expeditiously as possible, those lands available for oil and gas exploration and possible development, consistent with the Federal Land Policy and Management Act (FLPMA) of 1976, the Endangered Species Act of 1973, National Environmental Policy Act (NEPA) of 1969, and other applicable laws, regulations, and policies.

The BLM has air resource program responsibilities through its permitting programs and Clean Air Act (CAA) requirements. Section 176(c) of the CAA, as amended (42 U.S.C. 7401 *et seq*.), and regulations under 40 CFR part 93 subpart W, apply to projects within nonattainment and maintenance areas. Under those authorities "no department, agency or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan." Under CAA 176 (c) and 40 CFR part 93

subpart W, a Federal agency must make a determination that a Federal action conforms to the applicable implementation plan before the action is taken. As a federal agency, the BLM is responsible for completing a conformity determination; however, the San Joaquin Valley Air Pollution Control District (APCD) has air quality jurisdiction over the area where the parcels occur.

Secretarial Order 3289 addresses current and future impacts of climate change on America's land, water, wildlife, cultural-heritage, and tribal resources. On September 14, 2009, Secretary Ken Salazar launched a Department-wide approach for applying scientific tools to increase the understanding of climate change; the Order establishes a framework for Bureaus to coordinate climate change science and resource management strategies (http://www.blm.gov). This approach includes the development of a Climate Change Response Council and eight DOI Regional Climate Change Response Centers, which will work to synthesize and share climate change impact science and management strategies. In addition, through a network of Landscape Conservation Cooperatives, bureaus, agencies, partners, and the public will coordinate landscape-level strategies for managing climate change impacts regionally.

ISSUES AND SCOPING

The scoping process took place on September 8, 2011. A brief review of the parcels and discussion of the areas were conducted to identify any concerns relating to plants or animal species. During the scoping meeting we identified the areas that are outside of the California condor range, identified the areas of parcels that would be grouped, and outlined what issues need to be analyzed in the EA document for each parcel. No issues were identified that are outside of the scope of the analysis because each parcel is reviewed for specific resources; air, soil, water, biology, cultural, paleontology, recreation, lands, livestock grazing, farmland, floodplains, and visual resource are considered. Although not specifically identified as an issue during scoping, a discussion on climate change is included in the Air and Atmospheric Values section (Chapters 3 and 4), consistent with the BLM guidance and in response to public comments made on previous BLM lease sale decisions.

Chapter 2. Proposed Action and Alternatives

ALTERNATIVE 1: PROPOSED ACTION

The proposed action is that of the Bureau of Land Management (BLM) to conduct a quarterly competitive oil and gas lease sale of the unleased federal mineral estate. A total of 1,339.15 acres of federal minerals were analyzed for competitive lease. After a review of the 1,339.15 acres, BLM determined that 1,259.15 acres of those 1,339.15 would be offered. An 80- acre parcel will not be offered due to it being located within the Bakersfield City Limbit; 43 CFR 3100.0-3(2) *Exceptions* (iii) *Incorporated cities, towns,and village*;; however, the BLM is allowed to lease a parcel within the city limit where oil or gas is being drained; CFR 3100.0-3 (d) *Where oil or gas is being drained from lands otherwise unavailable for leasing, there is implied authority in the agency having jurisdiction of those lands to grant authority to the Bureau of Land Management to lease such lands…*

The proposed action is to offer 1,259.15 acres of unleased federal minerals estate identified by the parcel number referenced on Appendix A for oil and gas competitive auction to develop the federal mineral estate. All 1,259.15 acres of Federal mineral estate land that are considered for leasing, are split-estate (private surface with Federal subsurface minerals). All parcels would be subject to special leasing stipulations that would protect both endangered species and sensitive species and their habitat, as well as cultural, tribal and paleontological resources. All of the federal subsurface minerals are within the

jurisdiction of the Bureau of Land Management, Bakersfield, California. All parcels are within Kern County. There is one parcel that is all or partly within the administrative boundaries of an existing oil field; however, all parcels are within 0.5-2 miles of the administrative boundaries of existing oil fields. All of the parcels would have the Controlled Surface Use – Protected Species and Controlled Surface Use – Sensitive Species stipulations attached to each lease form 3100-11 upon lease issuance. See attached Appendix B for the text of these stipulations.

All of the parcels are private surface overlying federal minerals, known as "split-estate." The BLM has split estate guidance, (Washington Instruction Memorandum No. 2003-131) effective April 2003. The guidance addresses the purpose and the action that must be completed prior to any approval for new drilling. It also explains the rights, responsibilities, and opportunities of the BLM, lessee/operator, and the private surface owner. In addition, Onshore Order No. 1 also contains details about permits issued on split estate lands.

ALTERNATIVE 2: NO ACTION

Under the No Action alternative, the proposed parcels identified on Appendix A would not be offered for competitive oil and gas lease auction. In this option, BLM would not meet the requirement to offer lands available for oil and gas auction under the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act) and Energy Policy Act of August 5, 2005, Section 362(a)(1). In addition, the potential reserves that might be recovered would not be recovered if the lands were not leased.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

In lieu of leasing, the surface and mineral estate (split estate lands) under BLM jurisdiction could be considered potentially suitable for disposal through exchange under Section 206 of FLPMA. The mineral estate could also be considered for sale under Section 209 of FLPMA. Either of these actions would privatize the mineral rights, as opposed to merely leasing them for a set period of time, as in the proposed action. Analyzing the potential sale or exchange of these nominated lands and the associated policy implications are beyond the scope of this document. Therefore, an exchange or sale alternative will not be further analyzed. This option will be more fully addressed in the new Bakersfield RMP, slated for completion in 2012.

Chapter 3. Affected Environment

Socio-Economic

The current Federal oil and gas leases in California produced about 20 million barrels of oil and more than 5 billion cubic feet of gas in 2010. According to the Office of Natural Resources Revenue (*formerly* Minerals Management Service) statistics, the value of these products was $1.4 billion, generating royalties and other related revenue of more than $122 million. This revenue was split 50:50 with the State of California. Approximately 80-90% of this production comes from Kern County.

Visual Resource Management

No previous Visual Resources Management (VRM) objectives have been set for the field office. The Bakersfield Resource Management Plan will remedy this, however, in the interim and as directed by

BLM Manual-8400 (Visual Resource Management) the affected environment is described using the existing inventory and the proposed Visual Resource Management (VRM) classes from the draft Bakersfield Resource Management Plan are used to guide the interim visual resource management.

All parcels are within areas inventoried as Class IV areas where the characteristic landscape has had major modifications and the level of change in the basic landscape elements (line, form, color texture) due to management activities is high and these activities dominate the landscape and are the major focus of viewer's attention. All of these areas are proposed for classification as VRM Class IV by the draft Bakersfield Resource Management Plan allows such modifications to continue.

Visual Resource Management is applied to both federally managed surface and federal actions on private surface (i.e. split-estate management).

Recreation

Recreation opportunities and experiences managed for by the BLM are only available on federally managed surface. All parcels proposed for lease are located on split estate lands; (private surface overlying federal mineral estate). The U.S. Government has no legal access on those parcels nor authority to allow recreation use on those lands.

Air and Atmospheric Values

1. Air Quality

The parcels proposed for lease are located in Kern County, California, and within the San Joaquin Valley Air Basin. Although air pollution levels in the state have improved significantly in the past few decades, Californians experience the worst air quality in the nation (U.S. Global Change Research Program 2009). As recognized by the California Air Resources Board (CARB), California's climate and geography are conducive to the formation and accumulation of air pollution, especially in the Central Valley, (CARB 2007) where the proposed lease parcels occur.

At the federal level, regulatory duties lie with the U.S. Environmental Protection Agency (EPA), Region IX. At the state level, regulatory duties are delegated to the CARB. CARB regulates air pollution from mobile (cars, trucks, and buses) and other sources, while local air districts have authority to regulate businesses and industrial facilities. Oversight authority for air quality rests at the county level with the San Joaquin Valley Unified Air Pollution Control District (*SJVUAPCD*). The BLM has air program responsibilities through its permitting programs and Clean Air Act (CAA) requirements to analyze all actions for conformity to air quality plans.

The first comprehensive federal air pollution legislation was the Clean Air Act (CAA) of 1970. Among the most important provisions of the CAA are the sections relating to the establishment of National and State Ambient Air Quality Standards (NAAQS), nonattainment areas, the development of state implementation plans (SIPs), and federal conformity. The U.S. EPA has established NAAQS for seven criteria pollutants: ozone, respirable particulate matter (PM10), fine particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards for concentrations in order to protect public health. One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage.

The California Clean Air Act (CCAA) was enacted on September 30, 1988, and became effective January 1, 1989. The purpose of the CCAA is to achieve the more stringent health-based state clean air standards

at the earliest practicable date. California has established state air quality standards for the same criteria pollutants, plus additional pollutants (visibility reducing particulates, sulfates, hydrogen sulfide, and vinyl chloride). Although more stringent, the State standards have no specific dates to attain, unlike federal standards. Current federal and state ambient air quality standards are listed in Table AQ-1.

Table AQ-1. Current (2010) Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm (147 µg/m^3)[a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	15 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3	No Separate State Standard
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	53 ppb (100 µg/m^3)[b]	0.03 ppm (57 µg/m^3)
	1 Hour	100 ppb (188 µg/m3)[b]	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	24 Hour	—	0.04 ppm (105 µg/m^3)
	3 Hour	—	—
	1 Hour	75 ppb (196 µg/m^3)[c]—	0.25 ppm (655 µg/m^3)
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead (Pb)	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	No Federal Standards	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour		0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour		In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

[a]The 1997 8-hour standard is 0.08 ppm.

[b]The U.S. EPA is in the process of implementing this new standard(effective January 22, 2010). Note the EPA standard is in units of parts per billion (ppb) and California standards are in the units of parts per million (ppm). This standard is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.

[c]The U.S. EPA established new 1-hour SO_2 standard, effective August 23, 2010. EPA also revoked the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm. Note the new EPA standard is in units of parts per billion (ppb).

Sources: http://www.epa.gov/air/oaqps/greenbk/index.html

http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

Criteria pollutant concentrations are measured at a number of compliance monitoring networks throughout the State. Emissions inventory data from these monitoring networks are utilized to determine if areas meet federal standards (NAAQS). A geographic area that meets or exceeds the primary standard is called an attainment area; areas that do not meet the primary standard are called nonattainment areas (http://www.epa.gov/air/caa/peg/). Standards for 8-hour ozone and PM10 use a nonattainment area classification system based on severity (marginal, moderate, serious, severe, and extreme). Areas with

more severe air quality problems have later attainment dates and progressively more requirements; marginal areas have the least amount of time to attain the standard whereas extreme areas have the most time. The PM2.5 standard does not use a classification system, which simplifies the attainment year and planning requirements. Areas that are classified as nonattainment by the EPA are required to prepare and implement a State Implementation Plan (SIP) that identifies and quantifies sources of emissions and presents a comprehensive strategy to control and reduce locally generated emissions.

Several criteria pollutant concentrations currently meet NAAQS in the San Joaquin Valley Air Basin. However, based on the current EPA standards and designations, the primary pollutants of concern in the southern San Joaquin Valley are 8-hour Ozone and PM 2.5 (Table AQ-2). Kern County (San Joaquin Valley portion) is classified as non-attainment for 8-hour Ozone and PM2.5 under federal standards. The area is also designated as maintenance for PM10.

Table AQ-2. Attainment status of the San Joaquin Valley Air Basin

POLLUTANT	PLANNING AREA NAME	FEDERAL DESIGNATION
Ozone (8-hour)	San Joaquin Valley, CA	Nonattainment[1] Extreme[2]
PM2.5		Nonattainment[3]
PM10		Attainment[4]

[1]On April 30, 2007 the Governing Board of the San Joaquin Valley Air Pollution Control District voted to request EPA to reclassify the San Joaquin Valley Air Basin as extreme nonattainment for the federal 8-hour ozone standard. The California Air Resources Board, on June 14, 2007, approved this request. This request must be forwarded to EPA by the California Air Resources Board and would become effective upon EPA final rulemaking after a notice and comment process; it is not yet in effect.
[2]EPA classification (e.g. Moderate Extreme, or Severe,) establishes the required attainment date of the federal standard for Ozone and PM10.
[3]The Valley is designated nonattainment for the 1997 federal PM2.5 standards. EPA released final designations for the 2006 PM2.5 standards in December 2008 (effective in 2009), designating the Valley as nonattainment for the 2006 PM 2.5 standards.
[4] On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 maintenance plan.

Within the San Joaquin Valley Air Basin, Kern County's exceedances of the NAAQ's for 8-hour ozone have been episodic in nature; the numbers of violations of the NAAQS for ozone has declined. According to the SJVAPCD Annual Report to the Community (2010), the summer of 2010 was the cleanest on record in the Valley, continuing the 20-year trend. Based on the current 8-hour federal standard, there have been a greater number of "Good" air quality days than "Unhealthy" air quality days, and the number of "Good" days has continued to increase since 2000. Rules establishing controls for ozone precursor emissions have been implemented, but the air basin continues to be impacted by mobile source emissions, primarily from vehicle use.

In 2007, CARB adopted the *State Strategy* for achieving emissions reductions toward bringing these areas into attainment with federal standards for ozone and PM2.5. CARB's strategy was updated in the *2009 State Strategy Progress Report*, using revised emissions inventories reflecting recent economic downturn. California employs a comprehensive strategy aimed at reducing pollutants from a variety of sources of air pollution. Reactive Organic Gases (ROG) and oxides of nitrogen (NOx) from all sources have been reduced by 68 percent and 39 percent, respectively since 1980 (CAPCOA 2011). These emissions

reductions have resulted in significant improvements in ambient concentrations of ozone and particulate matter, in spite of dramatic increases in population, vehicles, and the number of miles driven.

The SIPs mainly addresses stationary sources that have been identified as major contributors affecting regional air quality, such as power plants, facilities, etc. District air quality plans outline the strategy for achieving federal air quality standards and identify control measures to reduce criteria pollutant emissions and are included in the SIP. The applicable implementation plans include: the *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, the *San Joaquin Valley Air Pollution Control District 2007 PM10 Maintenance Plan and Request for Redesignation*, and the *San Joaquin Valley Air Pollution Control District 2008 PM2.5 Plan (proposed)*.

Nonattainment area designations were made for the new 8-hour ozone standard in April 2004 and the *San Joaquin Valley 2007 8-hour Ozone Plan* was approved by the CARB in June 2007. The *8-hour Ozone Plan* calls for a 75% reduction of NOx (already reduced by 50% as of plan date) and full plan implementation will reduce VOCs by 25% as a result of regulatory measures. All of the proposed local measures in this plan will be adopted before 2012. However, since 80% of the Valley's total NOx emissions are from mobile sources, the bulk of necessary reductions must come from state and federal control measures for mobile sources, such as land use and transportation policies that reduce the number of vehicle miles traveled.

PM10 levels in the Valley have declined, since all control measure commitments have been adopted by the SJVAPCD and CARB. The Valley's improvement in PM10 air quality was due to permanent and enforceable emission reductions achieved through District and ARB rules and regulations. The EPA re-designated the San Joaquin Valley to attainment of the NAAQS for PM10 and approved the *2007 PM10 Maintenance Plan*. The *PM10 Maintenance Plan* includes an attainment emissions inventory, detailed conformity calculations, and demonstrates maintenance and verification of continued attainment by modeling. In addition, the plan evaluates future emissions growth and control up to 2020.

In 1997, the EPA set two PM2.5 standards, a 24-hour standard and an annual standard. Based on data from 2004 to 2006, the San Joaquin Valley complied with the 24-hour standard. In 2006, EPA revised the 24-hour standard to a lower level. Attainment plans for this new standard will be required; however, the *2008 PM2.5 Plan* focuses on the strategy to attain the 1997 annual standard. The *2008 PM2.5 Plan (proposed March 13, 2008)* builds upon the strategy adopted in the *2007 8-Hour Ozone Plan* to bring the Valley into attainment of the 1997 NAAQS. A SIP for the 2006 PM2.5 standard is due to the EPA 2012-2013. Based on the PM2.5 Plan, PM2.5 levels have decreased nearly 20% in the Valley from 1999-2007. The plan outlines a strategy that includes a comprehensive and exhaustive list of regulatory and incentive based measures to further reduce direct PM2.5 emissions and ozone precursor emissions (NOx and SOx). Confirmed by CARB modeling, analysis shows that the Valley can attain the annual PM2.5 NAAQS by 2014.

Applicable SJVAPCD Rules to Implement Air Quality Plans

Once air quality attainment demonstration Plans are adopted, the reductions necessary to meet the respective reduction mandates contained in the Plan(s) are achieved through prohibitory rules created and enforced by the local air quality board. Compliance with applicable Rules, Regulations, and land use and zoning requirements ensures continued movement towards achieving the SJVAPCD attainment goals.

The following section describes several of the pertinent SJVAPCD rules that may apply to oil and gas development subsequent to leasing.

Rule 2010 (Permits Required): This rule requires that any project constructing, altering, replacing, or operating any source operation, the use of which emits, may emit, or may reduce emissions, to obtain an Authority to Construct (ATC) and a Permit to Operate (PTO). This rule applies to the construction of the proposed renovations and operation of the new processes and equipment to be installed.

Rule 2201 (New and Modified Stationary Source Review): This rule applies to all new and modified stationary sources that would emit, after construction, a criteria pollutant for which there is an established federal or state AAQS. The rule provides mechanisms including emission trade-offs by which an ATC can be granted without interfering with the Basin's attainment with ambient air quality standards. These mechanisms offer methods to generate no net increases in emissions of nonattainment pollutants and their precursors over specific thresholds as detailed in the rule and the imposition of best available control technology for all emission increases.

Rule 2280 (Portable Equipment Registration): Certain portable emissions units would be required for well drilling, service or workover rigs, pumps, compressors, generators and field flares.

Rule 4101(Visible Emissions): The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere.

Rule 4401 (Steam-Enhanced Crude Oil Production Well Vents): The purpose of this rule is to limit the volatile organic compound (VOC) emissions from steam-enhanced crude oil production wells.

Rule 4623 (Storage of Organic Liquids): The purpose of this rule is to limit VOC emissions from the storage of organic liquids.

Regulation VIII (Fugitive PM_{10} Prohibitions): The purpose of Regulation VIII is to reduce ambient concentrations of particulate matter (PM_{10}) by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions. Regulation VIII rules pertinent to the proposed Project include, but are not limited to, the following:

Rule 8021 (Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities): This rule limits fugitive dust emissions (PM_{10}) from construction, demolition, excavation, extraction, and other earthmoving activities. This rule applies to any such activity and other earthmoving activities, including, but not limited to, land clearing, grubbing, scraping, travel on-site, and travel on access roads to and from the site.

Rule 8031 (Bulk Materials): The purpose of this rule is to limit fugitive dust emissions from the outdoor handling, storage, and transport of bulk materials.

Rule 4305 (Boilers, Steam Generators, and Process Heaters – Phase 2): The purpose of this rule is to limit emissions of oxides of nitrogen (NOx), and carbon monoxide (CO) from boilers, steam generators, and process heaters with a rated heat input of greater than 5 million Btu per hour.

Rule 4306 (Boilers, Steam Generators, and Process Heaters – Phase 3): The purpose of this rule is to limit emissions of oxides of nitrogen (NOx), and carbon monoxide (CO) from boilers, steam generators, and process heaters with a rated heat input of greater than 5 million Btu per hour.

In addition, the SJVAPCD document *Best Available Control Measures/Technology and Reasonable Available Control Measures/Technology Demonstration for Sources of PM10 and PM2.5 Precursors in*

the San Joaquin Valley Air Basin indicates current control measures recognized by SJVAPCD. These attainment demonstration and maintenance plans include sections on emissions inventory and control strategies and include discussions on oil and gas development. The oil and gas industry is highly regulated by the Districts; air plans are implemented through rule making which include a number of categories including permitting, equipment requirements and performance standards, dust and precursor emissions (NOx and SO_2) control, and several others. Any oil and gas activities authorized by the BLM would be required to comply with all of the applicable air quality rules and regulations, and air permit requirements. Nearly all activities that have the potential to emit criteria pollutants are regulated by local, state, and federal air regulatory agencies.

Conformity

As a federal agency, BLM is required to comply with all applicable air quality laws, regulations, standards and implementation plans (Section 118). The classification of any area as a federal nonattainment or maintenance area brings an additional requirement for federal agencies. Section 176(c) of the CAA, as amended (42 U.S.C. 7401 et seq.), and regulations under 40 CFR, part 93, subpart W, state that "no department, agency or instrumentality of the federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan." This means that under the CAA 176(c) and 40 CFR, part 93, subpart W (conformity rules), federal agencies must make a determination that proposed actions in federal nonattainment areas conform to the applicable EPA approved implementation plans (if pertinent) before the action is taken. As defined by 40 CFR 93 §153, *de minimis* levels are the minimum thresholds for which a conformity determination must be performed. Federal actions with emissions less than the *de minimis* levels are not required to complete general conformity analyses. Geographic areas that meet NAAQS are exempt from determining conformity with SIPs.

Climate and Meteorology

The Central Valley is one of the dominant features in the California landscape. The valley extends nearly 500 miles in length, while the width of the floor is approximately 45 miles. The San Joaquin Valley is surrounded by the Sierra Nevada Mountains to the east, the Pacific Coast range to the west, and the Tehachapi Mountains to the south. At the south end of the Valley, Bakersfield is approximately 400 feet in elevation.

California lies within the zone of prevailing westerlies and on the east side of the semi-permanent high pressure area of the northeast Pacific Ocean. The basic flow in the free air above the State, therefore, is from the west or northwest during most of the year. Within the State, several mountain chains are responsible for deflecting these winds and wind direction is likely to be more a product of local terrain than it is of prevailing circulation. Isotherms run mostly north-south, parallel to the contours of the mountains, instead of east-west as is common in most parts of the temperate zone. The climate and geography of the Valley create optimal conditions for forming and trapping air pollution. The San Joaquin Valley is particularly vulnerable to air pollution formation because of its topography, climate, and growing population. In addition, the Valley's hot summer temperatures promote the formation of harmful ground-level ozone, a major component of smog (www.valleyair.org).

The northern Central Valley has a hot Mediterranean climate while the southern portions in rain shadow zones are dry enough to be considered low-latitude desert. It is hot and dry during the summer and cool and damp in the winter, when frequent ground fog known regionally as "tule fog" can obscure visibility. Summer daytime temperatures are generally in the 90 degree F range, and heat waves may bring temperatures in excess of 104 ºF. The rainy season occurs mid-autumn to spring and the northern half of

the Valley receives greater precipitation than the arid southern half. The region is seasonably dry, as are most parts of the West; normal annual precipitation in the Bakersfield area is 5.83 inches (http://www.wrcc.dri.edu/).

Climate Change

Climate change refers to any significant change in measures of climate (e.g., temperature or precipitation) lasting for an extended period of time (decades or longer). Climate change may result from natural processes, such as changes in the sun's intensity; natural processes within the climate system (such as changes in ocean circulation); and/or human activities that change the atmosphere's composition (such as burning fossil fuels) and the land surface (such as urbanization) (IPCC 2007).

Some greenhouse gases (GHGs), such as carbon dioxide, occur naturally and are emitted to the atmosphere through natural processes and human activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities. The primary GHGs that enter the atmosphere as a result of anthropogenic activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These synthetic gases are powerful GHGs that are emitted from a variety of industrial processes. The major GHG compounds emitted from the oil and gas sector are carbon dioxide, methane, and nitrous oxide (CARB 2011).

Currently there are no tools (e.g. emissions factors, calculations) available to estimate GHG emissions for drilling a single well (CARB 2011). Specific emission limits have not yet been established; there are no federal significance thresholds for carbon dioxide equivalent (CO2e) emissions. Additionally, there is no technically defensible methodology for predicting potential climate changes from GHG emissions. As a result, GHG emissions that may occur subsequent to leasing as a result of the RFD scenario cannot be determined at this time. Consequently, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change and the anticipated regional effects. Quantitative evaluation is included where appropriate and practicable.

Ongoing scientific research has identified the potential impacts of anthropogenic greenhouse gas (GHG) emissions and changes in biological sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused CO2e concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC 2007) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Average temperatures in the United States have risen 1.5 F over the last 50 years (USGRCP 2009). Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1° F since 1900, with nearly a 1.8°F increase since 1970 alone. If emissions proceed at a medium to high rate,

temperatures in California are expected to rise 4.7 to 10.5° F by the end of the century; a lower emissions rate would keep the projected warming of the state to 3 to 5.6° F (Luers *et al*. 2006).

In 2001, the IPCC indicated that by the year 2100, global average surface temperatures would increase 2.5° to 10.4° F above 1990 levels. The National Academy of Sciences has confirmed these findings, but also has indicated there are uncertainties regarding how climate change may affect different regions. Recent analyses of global climate model predictions indicate that southern California will become hotter and drier (Christensen *et al*. 2007). Higher temperatures are projected to increase the frequency, intensity, and duration of conditions conducive to air pollution formation, potentially increasing the number of days conducive to air pollution by 75 to 85 percent in the San Joaquin Valley, under a higher emissions scenario, and by 25 to 35 percent under a lower emissions scenario (California Climate Action Team 2006). Based on the California Climate Action Team "Climate Scenarios" analysis, the projected temperature increases in California would result in widespread consequences including:

A 70-90 percent reduction of Sierra Nevada snowpack;

Range expansion in many species, range contractions in other species with significant populations already established;

A likely shift in the ranges of existing invasive plants and weeds; and

Up to a 55 percent increased risk of large wildfires.

In light of these projections, the DOI is taking the lead in protecting our nation's resources from these impacts and in managing our public lands to mitigate the effects of climate change. Secretarial Order 3289 addresses the impacts of climate change on America's water, land, wildlife, and cultural heritage resources. The Order established a framework for bureaus to coordinate climate-change science and resource management strategies (http://www.doi.gov/whatwedo/climate/index.cfm). The Climate Change Response Council, eight DOI Regional Climate Science Centers, and a network of Landscape Conservation Cooperatives (including Interior and other agencies) are working to communicate data and coordinate our response to the impacts of climate change within and among our bureaus.

With enactment of the California Global Warming Solutions Act of 2006 (AB 32; Stats. 2006, chapter 488), the California Air Resources Board (CARB) was tasked with several new responsibilities to help address the threat of global warming. AB 32 requires that California's greenhouse gas emissions be reduced to 1990 levels by 2020, which represents a 25% reduction under a business as usual scenario. Pursuant to AB 32, the CARB adopted their *Climate Change Scoping Plan* to reduce the state's GHG emissions to 1990 levels by 2020 (CARB 2008). The Scoping Plan will guide the CARB in developing detailed strategies to implement all of the recommended measures that must be in place by 2012 to reduce GHG emissions by 2020. Two of these new responsibilities, greenhouse gas emissions inventory and mandatory reporting, are complementary efforts undertaken by CARB to assess and monitor California's progress toward greenhouse gas (GHG) emissions quantification and mitigation. The first effort established the California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit. The second effort led to the adoption by the ARB of a regulation to require the mandatory reporting and verification of greenhouse gas.

On October 30, 2009, the US EPA published a rule for the mandatory reporting of greenhouse gases from large GHG emissions sources in the United States. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). In general, the threshold for reporting is 25,000 metric tons or more of carbon dioxide equivalent ($CO2_e$) per year, at the facility level. This rule was

revised November 30, 2010 to include the requirement to report fugitive and vented GHG emissions from crude petroleum and natural gas systems. Comprehensive, nationwide emissions data will provide a better understanding of GHG sources and will guide development of the policies and programs to reduce emissions (http://www.epa.gov/climatechange/emissions/ghgrulemaking.html).

To improve CARB's estimates of GHG emissions in California, they conducted an Oil and Gas Industry Survey in 2009 to accurately quantify equipment and operation processes for the 2007 calendar year. The *2007 Oil and Gas Industry Survey Results, Draft Report* was posted for public review and comment in August 2011 (http://www.arb.ca.gov/cc/oil-gas/oil-gas.htm). The survey was completed by 325 companies, representing approximately 97% of the crude oil and gas production in California. Total emissions for equipment covered under this survey are estimated to be 18.8 million metric tons of CO2e; combustion sources (equipment burning fuel for energy) account for 87 percent of the total CO2e emissions, while the remaining 13 percent of the CO2e emissions come from vented and fugitive sources (CARB 2011). Based on this survey, nearly 76% of the statewide total CO2e emissions for these operations occur in the San Joaquin Valley APCD.

The emissions data will be used to create a sector specific baseline inventory and to develop a control measure to reduce GHG emissions from the crude oil and natural gas production, processing, and storage sector (http://www.arb.ca.gov/cc/ghgsectors/ghgsectors.htm). Furthermore, CARB is in the process of developing protocols to quantify fugitive and vented emissions from upstream oil and gas operations. The two protocols under development are 1) quantification of methane, carbon dioxide, and VOC emissions from crude oil and produced water separation and storage tank systems; and 2) quantification of fugitive and vented carbon dioxide, and VOC emissions from crude oil and natural gas processes and equipment.

A number of other *Scoping Plan* measures have already been approved and/or adopted by CARB, including the Heavy-Duty Vehicle GHG Emission Reduction, Low Carbon Fuel Standard, Landfill Methane Control Measure, Tire Pressure and Tread Programs, Cool Car Standards and Test Procedures, and Port Ship Electrification. These measures and efforts will contribute to the goal of achieving emissions reductions, as outlined in the AB 32 Implementation Timeline (http://www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf).

Soil Resources

A soil map unit represents a delineated area dominated by one or more (complex) type of soil. Soils are identified and named according to taxonomic classification; soil types are based on defined properties and characteristics. The United States Department of Agriculture, Natural Resource Conservation Service (NRCS) soil surveys provide maps and detailed map unit descriptions that are useful tools for land management. These surveys and NRCS websites provide data (e.g. slope, soil pH range, salinity, clay content, and hydrological group) that are used to evaluate soil erosion and reclamation potential. The erosion potential of a soil is directly related to the slopes on which it is found. Typically, soils found on steeper slopes have a higher erosion hazard than those found on gentler slopes. According to the USDA-NRCS (2004), all soils occurring on slopes greater than 40% have poor reclamation potential based upon their high erosion rates.

Soils within the parcels proposed for leasing are described in two NRCS Soil Surveys: 1) Kern County, California, Northwestern Part and 2) Kern County, Southwestern Part. A total of six soil map units were identified on the parcels proposed for leasing. For discussion purposes, soils are described by lease parcel and grouped by geographic "unit".

Temblors Unit (Parcels 1-3) A total of four soil map units occur on these parcels. Soils identified on Parcel 1 include Kimberlina gravelly sandy loam (5 to 9 percent slopes) and Panoche clay loam (2 to 5 percent slopes). These soils formed in alluvium, derived from granitic or sedimentary rock. The Kimberlina soil has moderately rapid permeability and a moderate hazard of water erosion; adequate plant cover should be maintained to control erosion of these soils. Panoche soils are deep, well drained, and has very high available water capacity; runoff is slow and the hazard of water erosion is slight. However, in absence of plant cover the soil becomes more susceptible to erosion. These units are generally used and suited to livestock grazing.

Milham sandy loam (2 to 5 percent slopes) occurs on Parcel 2 only. Milham soils have high available water capacity, slow runoff, and a slight hazard of water erosion. Most areas of the unit are used for irrigated crops or livestock grazing. The Bitterwater-Delgado association (15 to 50 percent slopes) occurs on Parcels 2 and 3; these soils occur on foothills, and were formed in residuum derived from sandstone. Bitterwater-Delgado soils are 5 to 15 percent gravel with rapid runoff and a high hazard of water erosion; deterioration of the natural plant community results in erosion of these soils. Since slopes on Parcels 2-3 range from 15 to 50 percent, soils on these parcels may be considered limited based on slope alone. These units are generally used and suited to livestock grazing, while oil wells are common in some areas. No other applicable NRCS ratings or interpretations have been identified as limiting factors.

Buena Vista Unit (Parcel 4) Two soil map units were identified on Parcel 4: Haplocambids, thick-Elkhills complex (9 to 15 percent slopes), and Sodic Haplocambids, thick-Torriorthents, thin complex (15 to 30 percent slopes). These soils formed in alluvium, derived from sandstone, shale, and/or granitoid rock. Both units are well drained and the Sodic Haplocambids have very high surface runoff. Since slopes on these parcels do not exceed 40 percent, soils on these parcels are not considered limited based on slope alone. No NRCS interpretations have been identified as limiting factors for these soils; however accelerated erosion has already occurred in this survey area, primarily through petroleum extraction activities (USDA 2009). Effects of accelerated erosion are obvious in areas such as constructed roads and well pads because of bedrock exposure and removal of the surface layer.

Any project that disturbs one or more acres of soil is required to obtain coverage under the State Water Resources Control Board (SWRCB) General Permit for Discharges of Storm Water Associated with Construction Activity (SWRCB Order No. 2009-0009-DWQ). This permit is based on a project's overall risk and requires measures to prevent erosion and reduce sediment and other pollutants in their discharges.

Water Resources

There are no rivers, lakes, or streams on the proposed lease sale parcels that contain water year round; however, Parcel 1 is bisected by Devilwater Creek, a named, intermittent stream. In addition, unnamed intermittent creeks cross Parcels 2-4.

Any project that disturbs one or more acres of soil is required to obtain coverage under the State Water Resources Control Board (SWRCB) General Permit for Discharges of Storm Water Associated with Construction Activity (SWRCB Order No. 2009-0009-DWQ). This permit is based on a project's overall risk and requires measures to prevent erosion and reduce sediment and other pollutants in their discharges.

The proposed lease sale parcels occur in areas that are underlain by groundwater basins. All parcels are within watersheds governed by basin plans subject to federal and state Clean Water Acts. BLM will

require full compliance with all applicable federal, state, and local laws, policies, rules and regulations to protect both surface and groundwater.

Biological Resources Including Riparian and Wetlands

To facilitate discussion, the four properties included in this action have been divided into two Biological Units, i.e., groupings of adjacent parcels with similar ecological values. Unit names reflect some aspect of local geography. Information presented for each Biological Unit includes general topography, notable disturbance, vegetation, common animals, and potential sensitive species. For some units, particular characteristics of individual parcels are also noted. All of these parcels are split estate, where private lands overlie Federally-owned mineral rights.

Many of the lease sale parcels are located within specially designated habitat zones, as identified in the Caliente RMP and the Draft Kern County Habitat Conservation Plan. All of the parcels are within habitat corridors (green zone) where the emphasis is on maintaining connections between habitat reserves and in providing additional native habitat. Surface disturbance can go as high as 25% in green zones. Generally, existing land use meets these objectives; however, some privately-owned, green and red zone lands have been developed for agriculture within the conservation strategy designation and are no longer suitable habitat.

Special Status Species includes federally listed, state listed and BLM California sensitive species. Each unit discussion includes a discussion of Special Status Species. Information on potential rare plants for these parcels comes from CNDDB, the CNPS Rare Plant Inventory, and the Consortium of California Herbaria.

Temblors Unit (parcels 1-3)

The Temblors Unit consists of 1179 acres located on the west side of the San Joaquin Valley, on the eastern slopes of the Temblor range, north and south of Seventh Standard Road. Parcels 2 and 3 lie directly north of the Chico Martinez ACEC. The three parcels are to the west of the Cymric oilfield. Elevations range from 1000 to 1280 feet. Topography is moderate to gently sloping hills. Currently, parcel 1 is used for grazing livestock. Dirt roads and trails are evident in all three parcels. Judging from images visible on air photos, there appears to be a considerable amount of surface disturbance associated with past mining prospects in parcels 2 and 3. There is an accumulation of tanks and other industrial elements near the western border of parcel 2. Trough areas and extensive livestock trailing are visible in parcel 1.

Vegetation in the Temblors Unit includes is primarily non-native grassland and bare shale expanses. There may be a small amount of saltbush present, but no discernible saltbush scrub vegetation. Parcel one is all non-native grassland, while parcels 2 and 3 are a mixture of non-native grassland and bare shale.

The grassland is dominated by introduced species such as red brome (*Bromus madritensis* ssp. *rubens*), Arabian grass (*Schismus* spp.), red-stemmed filaree (*Erodium cicutarium*). Native species include various buckwheats (*Eriogonum*), fiddleneck (*Amsinckia* sp.), lupine (*Lupinus* spp.), popcorn flower (*Crypthantha* spp.), peppergrass (*Lepidium* spp.), goldfields, (*Lasthenia* spp.), layia (*Layia* spp.), and hillside daisy (*Monolopia lanceolata)*. Occasional shrubs may be present, including common saltbush (Atriplex polycarpa), alkali goldenbush (*Isocoma acradenia* var. *bracteosa*), bladderpod (*Isomeris arborea*), goldenbush (*Ericameria linearifolia*), and snakeweed (*Gutierrezia californica*).

Weeds to be expected include horehound (*Marrubium vulgare*), Russian thistle (*Salsola tragus*), tocalote (*Centaurea melitensis*), and tree tobacco (*Nicotiana glauca*). Saltcedar (*Tamarix* sp.) may be present in some arroyos.

Wildlife to be expected within the Temblors Unit include side-blotched lizards, western whiptail, blunt-nosed leopard lizard, coachwhip, gopher snake, common kingsnake, western diamondback rattlesnake, turkey vulture, Northern harrier, red-tailed hawk, American kestrel, mourning dove, greater roadrunner, barn owl, burrowing owl, horned lark, common raven, Northern mockingbird, loggerhead shrike, lark sparrow, sage sparrow, white-crowned sparrow, western meadowlark, desert cottontail, black-tailed hare, San Joaquin antelope squirrel, California ground squirrel, San Joaquin pocket mouse, Heerman's kangaroo rat, giant kangaroo rat, short-nosed kangaroo rat, deer mouse, Tulare grasshopper mouse, coyote, San Joaquin kit fox, badger, and bobcat.

Special status animal species with the potential to occur on the Temblors Unit includes blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin kit fox, San Joaquin antelope squirrel, burrowing owl, short-nosed kangaroo rat, San Joaquin pocket mouse, Tulare grasshopper mouse and pallid bat. Prairie falcons have also been reported in the area. Recent biological surveys conducted during geophysical projects in the Chico Martinez area have not identified widespread small mammal burrowing, possibly a consequence of the shale soil, which is a poor substrate for burrowing activity.

Rare plants in the area include the federally endangered San Joaquin woollythreads (*Monolopia congdonii*), the recently delisted Hoover's woollystar (*Eriastrum hooveri*). BLM sensitive species which may be present include Temblor buckwheat (*Eriogonum temblorense*), recurved larkspur (*Delphinium recurvatum*), diamond-petaled California poppy (*Eschscholtzia rhombifolia*), and pale yellow layia (*Layia heterotricha*).

Buena Vista Unit (parcel 4)

The Buena Vista Unit consists of 80 acres located South of Hwy 119 and north of the historic Buena Vista Lake bed in southern Kern County. Elevation ranges from 380 to 480 feet. Topography is moderate to gently sloping hills. A number of dirt roads cross the parcel and there appears to be an old pad in the northeast corner.

Vegetation in the Buena Vista Unit consists of non-native grassland and saltbush scrub. Non-native grassland is present throughout the unit while saltbush scrub is found on n-facing slopes and arroyo bottoms. The grassland is dominated by the non-native red brome (*Bromus madritensis* ssp. *rubens*), Arabian grass (*Schismus* spp.), and red-stemmed filaree (*Erodium cicutarium*). Native annuals expected include fiddleneck (*Amsinckia* sp.), popcorn flower (*Crypthantha* sp.), peppergrass (*Lepidium* spp.), and goldfields (*Lasthenia* spp.). Small shrubs present within the grassland include alkali goldenbush (*Isocoma acradenia* var. *bracteosa*), and snakeweed (*Gutierrezia californica*). Locoweeds (*Astragalus* spp.) are also common. The saltbush scrub is dominated by common saltbush (*Atriplex polycarpa*) and would include elements from the grassland community.

Wildlife expected in the area include coyote, California ground squirrel, black-tailed jackrabbit, cottontail, Heerman's kangaroo rat, short-nosed kangaroo rat, Tulare grasshopper mouse, San Joaquin pocket-mouse, deer mouse, common raven, mourning dove, mockingbird, white-crowned sparrow, sage sparrow, savannah sparrow, side-blotched lizard, western whiptail, western rattlesnake, and gopher snake.

Special status animal species with the potential to occur on these parcels include blunt-nosed leopard lizard, giant kangaroo rat, San Joaquin kit fox, San Joaquin antelope squirrel, burrowing owl, short-nosed kangaroo rat, San Joaquin pocket mouse, Tulare grasshopper mouse and pallid bat.

The recently delisted Hoover's woollystar (*Eriastrum hooveri*) occurs just north of the general area and would be expected to occur within these parcels. Nearby BLM sensitive species include heartscale (*Atriplex cordulata*), oil neststraw (*Stylocline citroleum*), Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*), and Lost Hills crownscale (*Atriplex vallicola*).

Riparian and Wetland Habitat

There is no riparian habitat present within the Temblors or Buena Vista units. The lease parcels support only dry washes or ephemeral drainages where water flows only in direct response to rainfall events, and no riparian vegetation occurs.

Cultural Resources

The lease parcels within all of the Units identified in this document fall within the traditional territories of the Tulumne, Paleumne, Yowlumne and Tuhoumne Yokut Indians (Latta 1977: 201). These groups primarily inhabited the shores and sloughs of Tulare and Buena Vista Lakes. In addition to the lake environments, they also exploited specialized resources found in the foothills of the Temblor Mountains to the west and the Sierra foothills to the east. Prehistoric sites common to this region include bedrock mortar and millingstone food processing stations, lithic scatters and quarries, and village sites. From historical to modern times, locations for all of the lease parcels have been part of large-scale oil production development, as well as livestock and agricultural operations. Oil exploration became commercially productive in the area as early as the 1890s (Rintoul 1976: 4). Historical properties occurring in the area include facilities associated with the early phases of this agricultural and oil field development.

A record search for the occurrence of any known prehistoric or historical cultural sites was completed for all four of the lease parcels. None of the lease parcels have been previously surveyed for the presence of cultural resources. There are no known archaeological sites within any of the lease parcels. The majority of the areas surrounding these parcels have not been previously surveyed for cultural resources.

Native American Values

As indicated above, the lease parcels are all located within the traditional territories of several different bands of Valley Yokuts tribal groups. Members of these Native American communities still reside in the surrounding San Joaquin Valley. These include both the federally recognized Tachi Yokuts of the Santa Rosa Rancheria and the Tule River Indian Reservation, and several non-recognized groups and individuals. Culturally significant remains associated with Native American ancestral occupation of this region are scattered throughout the area. Federal lands management regulation and policy requires that these people be consulted regarding potential impacts to places of cultural or religious importance as a result of actions occurring on federal lands. The procedures and results for Native American consultation conducted for the March 2012 lease sale are discussed in the impacts section below.

Paleontological Resources

Based on the proximity to known paleontological localities or geological formations, specific areas can be assessed for the potential presence of paleontological deposits. Several of the parcels in this lease sale are in areas with some degree of known sensitivity for the potential presence of significant paleontological deposits.

Livestock Grazing

There are no federal grazing authorizations within the proposed action.

Lands

The lands proposed for competitive leasing of the federal mineral estate are mainly scattered split estate mineral parcels (private surface overlying federal minerals) under the jurisdiction of BLM. For the split estate parcels, the United States not only owns any minerals in the land, but also surface entry rights that 'float' over the entire parcel.

Parcel 1 is located on 'split estate' land (private surface overlying federal mineral estate). There appears to be a creek that runs through the SE¼ of the section. There are surrounding roads through private land. The parcel is south of the Antelope Hills oil field. The U.S. Government has no legal access.

Parcel 2 and 3 are located on 'split estate' land (private surface overlying federal mineral estate). There appears to be a road that goes through the parcel; however, the U.S. Government has no legal access.

Parcel 4 is located on 'split estate' (private surface overlying federal mineral estate) between Highway 119 and the California Aqueduct near the Buena Vista golf course. This parcel is within the South Coles Levee oilfield. There appears to be a road that goes through the parcel; however, the U.S. Government has no legal access to the parcel.

Farmland

Prime farmland is of major importance in meeting our Nation's short and long term needs for food and fiber. As defined by the USDA, this land has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and is available for these uses. Soils classified as farmland are either used for producing food and fiber, or are available for these uses. However, urban or built up land, public land, and water areas cannot be considered prime farmland. Although public land cannot be considered farmland, the USDA classifications apply to split-estate parcels.

No soils classified as Prime Farmland or Farmland of statewide importance were identified on the parcels proposed for lease. However, soil map units that have been identified by the USDA-NRCS as Prime farmland, if irrigated, do occur on Parcels 1 and 2.

Oil and Gas Resources

The parcels are in Kern County. All of them are classified as having high potential for occurrence of hydrocarbons. This is one of the oldest oil districts in the United States, and has been extensively developed in the anticlinal trends along the east and west sides of the Valley since the 1870's.

Most reservoirs in the area are sandstones which have adequate porosity and permeability for the migration of oil and gas. Some reservoirs in the area are fractured siliceous organic shales of the Monterey formation. The Monterey formation is both the source and reservoir rock. Compression and diagenesis severely degrade reservoir quality at depths exceeding 12,000 feet to the extent that only dry gas is produced from greater depths.

The following statistics are from the California Division of Oil, Gas, and Geothermal Resources (CDOGGR) website shown below. There are over 75 oil and gas fields in the Valley, including several giant fields (more than 100 million barrels of oil each) and supergiants (more than 1 billion barrels each). As of the end of 2008, cumulative production in the area was about 12.4 billion barrels of oil equivalent. In recent years, the Valley has accounted for about 85-90% of California's development completions. Over 90% of the wells are on private leases. Between 2005 and 2009, there were a total of 11,530 wells drilled in DOGGR District 4, which is mainly Kern County. In the same 5 years, there were a total of 1,153 federal wells drilled throughout California. Approximately 90% of those wells were in Kern County. The ratio of federal wells vs. total wells has remained relatively constant at 6-10% throughout time, although the exact numbers are not readily available.

The San Joaquin Valley is expected to continue as the primary source of oil in California's oil and gas development. Additional information such as the number of existing wells and expected drilling, completion and abandonment rates is in the section on Environmental Consequences.

Sources: ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2008/PR06_Annual_2008.pdf for 2008
Similar for other years 2004 - 2009. As of 9-30-2011, 2009 is the most recent year for which DOGGR statistics are available.

Chapter 4. Environmental Impacts

Analysis Assumptions – Reasonable Foreseeable Oil and Gas Development (RFD) Scenario

General Discussion

Exploration activities within the area will generally focus on oil and not natural gas. The mid to southern San Joaquin Basin is primarily an oil province with small amounts of natural gas as an associated product. Less commonly, non-associated gas is also found. Exploration will use such tools as geophysical surveys (usually this means running seismic lines), and drilling exploration wells. A brief summary of these activities follows. In all cases, a site specific EA would be prepared prior to approval of any application to conduct surface disturbing activities (see previous discussion under *IV. Conformance with Existing Land Use Plans)*. Detailed descriptions of typical oil and gas activities may be found in the Caliente Resource Management Plan, December 1996, Ch. 5 page 45.

Climate change analyses are comprised of several factors, including greenhouse gases (GHGs), land use management practices, the albedo effect, etc. The tools necessary to quantify climatic impacts are presently unavailable. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that contribute to climate change. Qualitative or quantitative evaluation of potential contributing factors are included where appropriate and practicable.

Exploration Activities

After seismic and/or detailed stratigraphic basin studies are made, an APD may be submitted. Because of the location of nearly all of the lands within this EA, any APDs would likely be for exploration drilling,

which includes drilling to discover entirely new fields, or discovery of previously untapped reservoirs within existing fields. Drilling to discover new fields is of greatest concern in this EA because in most cases it would be more likely to involve disturbances of previously undisturbed lands. Historically in the San Joaquin Valley, only about 10-15% of wildcat wells have been successfully completed as producers. In fact, between 1990 and 2007, 64 total exploratory wells were drilled, both federal and private (source: personal email from Mark Gamache, CDOGGR, to Jeff Prude, BLM, dated 3-27-07), and only one relatively small field (Rose field, discovered July 2000) was discovered.[1] The remaining 85-90% of the wells are non-producers which are immediately plugged and abandoned (P&A'd), so any disturbance associated with the drilling of these P&A'd wells would be temporary. It should be noted that only two-four exploratory (wildcat) wells have been drilled on federal leases issued in the last ten years.

Development Drilling

Development wells include step-out or field extension wells, enhanced oil recovery wells, or other infield wells. Even though the drilling of development wells will be adjacent to or actually within areas of current production, it still may require some disturbance on previously undisturbed lands.

Based on the data for the past 10 years, up to 40,000 wells are projected to be drilled on Federal, state and private lands in the San Joaquin Valley in the next 10 years. If historical trends continue, (and there is no data to suggest otherwise), about 1,500-3,800 of those will be on federal mineral estate. Nearly all of these will be within the same general area of the state as lands covered by this EA. The vast majority (up to 90% or more) of these wells will be on private mineral estate.

Approximately 95-97% of the wells projected to be drilled during the next ten years will be development wells (as opposed to exploratory wells). An estimated 95+% of the development wells will be successful, while the remainder will be unsuccessful and will be plugged and abandoned upon completion of drilling.

Most new leases in California are never drilled, and only a very few result in producing wells. In fact, from lease sales in this general area (Kern County) in the past 10 years (October 1, 2001, through September 30, 2011), less than 5% of all leases issued have had any wells drilled (12 out of 239). The average number of wells drilled was 1 well per 3,200 acres (43 wells on 137,591 acres). See Table 1 – Activity on New Leases from Past 10 Years Lease Sales.

TABLE 1 - Activity on New Leases from Past 10 Years Lease Sales
(Sales 10-1-2001 through 9-30-2011)

	Kern County
Number of Lease Sales with Parcels in Kern since 10-1-2001	20
Leases Issued in Kern County	239
Total Wells Drilled (may include wells in "drilling" status)	43 (approx. 37 productive)
Acres Leased	137,591
Leases w/ Wells Drilled	12 of 239
Leases with Successful Producing Wells	6 of 239
Lease Sales w/ at Least 1 Well Drilled on New Leases	9 of 20
Total New Surface Disturbance for all wells, including	30

[1] A new field discovery, reportedly near the Elk Hills field in Kern County, was reported by Oxy in July 2009. No further details are available as of press date.

	Kern County
roads (acres)	
Avg. Disturbance per Well (acres)	<1

The total number of acres of Federal mineral estate in the San Joaquin Valley is about 440,000 acres. The total number of acres in the parcels to be offered in this lease auction is about 1,259 acres, less than ½ of 1% of the total. From the 20 lease sales conducted in this general area (Kern County) during the past 10 years, (10-01-2001 through 09-30-2011), BLM has issued 239 leases covering approximately 137,591acres. Only 12 of the leases have had any wells drilled on them. Eleven leases had 1-2 wells and one lease had 27 wells, for a total of 43 wells. Approximately 85-90% of the wells were productive. Nearly all of the dry holes and several that were productive only for a short time have already been plugged, and the well sites are in various states of reclamation, depending on how long it has been since abandonment.

Nine of the 20 lease sales conducted during 2000, 2002, 2003, 2004, 2006, 2007, and 2010 had at least one lease that had drilling. Of those, three years had a sale with at least one successful well drilled, and four years had no leases with any successful drilling. The most wells drilled on any parcel were twenty seven, on a lease in the Edison Field on the eastern edge of Bakersfield. See Appendix D – Oil and Gas Activity on Leases from Recent Lease Sales.

Lands considered in this EA are all within two miles of existing oil fields, and they are all in areas classified as "high potential." However, virtually all of the lands that were leased in the past also met the same criteria, and most were never developed.

This 10 year time frame includes periods with both very high and very low oil and gas prices: on average, it is a relevant base period from which reasonable projections can be made. Because prices are significantly higher now than in the past, there is a possibility that drilling on new leases will increase. However, the new leases offered herein still represent only a small fraction of lands already leased and available for drilling, so we do not expect these particular parcels to see anomalous levels of drilling. Data to suggest otherwise is not available. As mentioned earlier, only one new lease within the past 10 years has had more than two wells drilled on it, and there is no data to suggest that these parcels are likely to have more wells than that. Based on the historic levels of activity on new federal leases in California within the last 10 years, during a wide range of product prices, we would expect no more than one well total on all of these parcels, with no particular area being more likely than another to be drilled.

Hydraulic fracturing

Hydraulic fracturing is a common and important process to stimulate oil and gas well production, and it has been used more than 1 million times for many years all over the world. Fracturing fluid is pumped under high pressure down the wellbore and into the reservoir rock to create fractures (i.e., cracks) in order to increase the immediate production rate and ultimate total recovery of oil and natural gas over the economic life of the well. In a typical frac job, approximately 99.5% of what is injected is water and sand.

In FY 2010, only about 5 percent of the federal wells drilled in California (approx. 15 out of 300+) employed fracturing. None of these used diesel as the frac fluid, a source of concern to the public. In addition, none of these were in areas where there were fresh water aquifers, another area of concern.

According to industry sources, it is likely that more California wells in the future will be fractured because of recent interest in deep shale prospects. Current Federal regulations require no special reviews

or approvals for routine fracturing, assuming prudent operating practices are employed and no new surface disturbance occurs. For non-routine fracturing, the operator needs prior approval.

BLM is seeking ways to reassure the American public that fracturing on BLM land is safe and has begun discussions with interested parties on the practice and regulation of fracturing on BLM land. To that end, BLM California will be working closely with the California Division of Oil and Gas and Geothermal Resources (CDOGGR), other Federal and California State agencies, and industry trade groups (such as the Western States Petroleum Association (WSPA), California Independent Petroleum Association (CIPA), and the Independent Oil Producers' Agency (IOPA) to address the issue. When current studies are complete, BLM will implement any new regulations that may be issued, and those new regulations will be incorporated into our standard Conditions of Approval for new wells and workovers of existing wells.

Location of Parcels and Past Drilling Activity

All parcels are within 2 miles of the administrative boundaries of existing oil fields. In addition, there is one parcel (Parcel 4) all within the administrative boundary of an existing oil field (South Coles Levee), with a total of 80 acres within that field boundary. One-two dry holes were drilled on each of the Parcels (a total of 5 dry holes). There was one well on parcel 4 that was originally producers, but now is plugged.

Although it could be argued that some areas are closer to known production, and therefore more likely to see development, it is also possible that those areas have been more effectively "condemned" by the unsuccessful exploratory wells that were drilled in the past. Overall, there is not enough data to make more accurate projections of where activity might occur, and whether it would be successful.

Although the range of wells drilled per lease sale during the last ten years has ranged from none to 27, nearly all of the leases issued in the past 10 years have not seen any drilling (227 out of 239). In addition, the average density of wells per acre was one well per 3,200 acres (43 wells on 137,591 acres). Therefore, it is reasonable to project one well for this lease sale. Any future development on parcels in this lease sale would therefore represent only a very small portion of the total wells drilled on the federal mineral estate, and is well within the scope of activities which have been previously analyzed in the Caliente Resource Management Plan and the Reasonable Foreseeable Oil and Gas Development. The total expected number of wells expected on these parcels, one, is insignificant in comparison to the total number of wells and other activities expected in the area.

For details on the projected disturbance, see Table 2 below.

Table 2. Expected new surface disturbance on March 14, 2012, lease sale tracts with Preferred Alternative Lease with Controlled Surface Use - Protected Species (CSU - Protected Species) and Controlled Surface Use – Sensitive Species (CSU – Sensitive Species) Stipulations - Proposed Action).

Surface Activity	Number	Acres			
		Permanent	Temporary	Transient	Total
Wells Drilled, incl. roads and facilities	1 well	<1			<1

The acres of disturbance were based on the total new disturbance of approximately 30 acres for the 43 wells drilled on leases issued at the last 10 years of lease sales. See Appendix D – "Oil and Gas Activity on Leases from Recent Lease Sales" for details on previous disturbance. Significant efforts will be made to use existing roads, rights of way, and to minimize disturbance wherever possible. In addition, no

seismic exploration (vibroseis/shot holes, roads, etc.) was projected because seismic activities are not a result of leasing activities; in other words, seismic activities can occur regardless of whether or not the lands are leased.

Ongoing Reclamation of Existing Disturbed Surfaces

The potential disturbance of less than one acre will be considered to be permanent disturbance. Although new wells continue to cause surface disturbance, recent trends have shown that the total acres of newly disturbed land are being significantly offset by the large numbers of wells that are being abandoned in this area. According to the CDOGGR, during the last 5 years for which records are available (2005-2009), there were 11,530 wells drilled in Kern County, of which approximately 10,101 were completed. However, during that same period, 8,769 wells were abandoned (87% of the number of newly completed wells.). It is reasonable to assume that this trend will continue. (Data from the California Department of Conservation, Division of Oil and Gas).

Source: ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2008/0101summary3_08.pdf.

Proposed Action Alternative – Direct and Indirect Impacts

Social-Economic

The proposed action will potentially allow new development of these parcels for oil and gas production. Due to the very small amount of development expected on these lands, it is not likely that there will be any measurable impact to the local economy.

Visual Resources

Potential impacts from oil and gas development include changes to the basic landscape elements of form, line, color and texture. These changes result from installation of new structures (e.g. oil wells, power lines, tanks etc.) and earthwork associated with well pads, roads and other developments. In the areas identified for management for VRM Class IV objectives these changes are an acceptable impact to the existing landscape as other resource values outweigh the scenic aspects of the environment.

All development will implement, BLM Best Management Practices for Visual Resource Management in Oil and Gas Development. This includes, but is not limited to, proper site selection, minimizing disturbance, selecting colors that blend with the background, and reclaiming areas that are not in active use.

Recreation

There are no impacts on recreation as there are no recreational opportunities provided by the split-estate lands proposed for lease.

Air and Atmospheric Values

Planning Assumptions for Air Quality: State Implementation Plans (SIPs) are prepared (and adopted) for most of the federal nonattainment areas. These SIPs are implemented through a series of rules and are designed to result in compliance with the NAAQS by federally imposed deadlines. Provisions and commitments in SIPs are federally enforceable. In addition, air quality is highly regulated by a number of additional federal, state and regional rules and regulations. These rules and regulations apply to many of

the activities that may occur as a result of the proposed action. Any lease development activities would be required to be conducted in compliance with current and future SJVAPCD, CARB, and US EPA Rules and Regulations. As new air plans are developed, or existing plans are updated, activities would be conducted in compliance with those plans also. A degree of uncertainty exists as to the exact development schedules, well location, the number of wells that would be drilled, and a number of other factors which are addressed in the RFD. This analysis is based on the same assumptions discussed in the RFD.

Impacts to Air Quality

At the leasing stage, it is extremely difficult to generate a meaningful estimate of emissions associated with an unknown well type, target depth, in an unknown location, with an unknown lessee, operator, drilling contractor, etc. Since current federal oil and gas operators utilize various drilling contractors and construction companies, modeling at this time would be hypothetical. Details on fleet (vehicle and equipment make, model, engine size, etc.), trip length, project acreage, and the construction schedule are among several variables required to generate emissions estimates. Combined, these factors determine the intensity, duration, and characteristics of associated pollutants.

The proposed action could result in a number of activities which generate criteria pollutant emissions. Impacts would be in the form of gaseous and particulate matter that is emitted into the air as a result of the activities associated with oil and gas lease development. Project emissions include direct emissions of nitrogen oxides (NOx), sulfur oxides (SOx), and Volatile organic compounds (VOCs) (which are precursor emissions for ozone and PM2.5), carbon monoxide (CO), particulate matter smaller than 10 microns (PM10), and particulate matter smaller than 2.5 microns (PM2.5). These emissions are associated with combustion sources and fugitive sources associated with exploration, drilling, production and abandonment such as seismic exploration/diesel drill rig engines, drill pad construction equipment (e.g., dozers, backhoe, grader, etc.), temporary production flares, remedial well work, equipment trucks, hauling of liquids, drill rig crew trucks/vehicles, portable lift equipment, portable testing equipment, temporary and permanent production facilities.

In addition, PM10 will be released during the drill pad construction phase, and from the daily ingress and egress of vehicles on the unpaved access roads. The primary emission sources during any new construction would be from heavy equipment exhaust and fugitive dust. Other emission sources will occur during lease operation and maintenance. These sources include oil facilities, gas facilities, operator vehicle traffic, and gas powered oil well pumping units.

According to the CARB, emission factors for VOCs (volatile organic compounds), NOx (nitrogen dioxide), SOx (sulfur dioxide), PM10 and PM 2.5 are not available for individual wells, but can be calculated using total emission per day calculations that have been obtained from the California Air Resources Board website (http://www.arb.ca.gov/app/emsinv/emssumcat_query). These emissions totals for the San Joaquin Valley Unified APCD are included in Table 4.

Table 4. 2008 Estimated Annual Average Emissions, San Joaquin Valley Unified APCD

SOURCE	TOG (TONS/DAY)	ROG (TONS/DAY)	NOX (TONS/DAY)	SOX (TONS/DAY)	PM10 (TONS/DAY)	PM2.5 (TONS/DAY)
Oil and Gas Production	47.61	27.44	0.32	0.06	0.02	0.02
Oil and Gas	20.68	7.16	11.47	1.90	1.77	1.77

SOURCE	TOG (TONS/DAY)	ROG (TONS/DAY)	NOX (TONS/DAY)	SOX (TONS/DAY)	PM10 (TONS/DAY)	PM2.5 (TONS/DAY)
Production (combustion)						
Total Oil and Gas(tons/day) SJVUAPCD	68.29	34.60	11.79	1.96	1.79	1.79
TOTAL Oil and Gas (tons/day) Statewide	118.21	51.21	23.60	2.52	2.20	2.25

This table illustrates the emissions for oil and gas production sources reported by the SJVUAPCD relative to the statewide totals, in tons of pollutants per day. Oil and gas production is defined as any source used in the production of oil and gas, including but not limited to wells, pumps, tanks, roads, maintenance traffic, and heaters. Steam generators are calculated separately and are represented on the table as oil and gas production (combustion). For purposes of this analysis, these numbers are summed to get the total amount of pollutants emitted by oil and gas production in the SJVUAPCD.

In regards to both PM10 and PM2.5, the SJVUAPCD does not have a standard for calculating emissions for individual wells (source: conversation 2007 with Leonard Scandura, SJVUAPCD). The SJVAPCD does not permit individual wells; generally a facility such as a tank setting that serves a number of wells is the permitted stationary source. However, wells in California are subject to Fugitive Inspection and Maintenance, Rule 4409.

An emission formula and emission factor was provided by Air Quality Engineer Leonard Scandura of the SJVAPCD. The formula is E = A x EF where E= emissions, A= activity or source, and EF is the constant emission factor. Criteria pollutant emissions were calculated for one well based on the 2008 SJVUAPCD Annual Emissions from Oil and Gas Production; these calculations are included in Appendix E.

For one well, estimated emissions of PM2.5, PM10, and SOx range from approximately 30-36 lbs/year. Per well, NOx emissions are estimated at 375 lbs/year and 1,200 lbs/year of VOCs. It is important to note the difference in unit of measurement; the statewide emission inventory data are indicated in tons per day, while the emissions estimates for the proposed action are expressed in pounds/year. This range of pollutant emissions represents 0.001%-0.002% of the total emissions from oil and gas production in the San Joaquin Valley air basin. The expected emissions from the proposed action would be low both in relation to the overall activity in the region, and by itself.

As detailed in the affected environment, the San Joaquin Valley Air Basin is designated nonattainment for ozone and PM2.5. The District's adopted ozone and PM10 plans are already providing benefits for PM2.5 and ozone levels. The District attributes the Valley reaching attainment of PM10 standards ahead of schedule to the control strategies set forth in the 2003 PM10 Plan and the 2006 PM10 Plan (SJVAPCD 2008).

BLM requires that the lessee/operator assume responsibility for ensuring that all operations are properly permitted with the appropriate agencies, and that the operations are in compliance with all mobile and stationary source guidelines. This is consistent with the SJVUAPCD requirements; the District holds the owner/operator responsible for obtaining permits, or ensuring that the proper permits are in place for their contractors (Personal communication, Homero Ramirez, SJVUAPCD). Mitigation measures are imposed

by the air permitting authority and would include such items as use of low-emission construction equipment, use of low sulfur fuel, and/or use of the existing power transmission facilities, where available, rather than temporary power generators. The failure of the lessee/operator to follow the air quality rules and permit requirements will result in penalties and potentially lead to the loss of and air district and the BLM authorizations.

The State and local air districts have air quality primacy; BLM may however choose to implement control measures to reduce effects on air quality. BLM may apply Best Management Practices (BMPs) and implement adaptive management practices to reduce particulate matter emissions even though air quality standards would not be violated without implementation of such measures. BLM *Best Management Practices and Options for Air Quality Control for Specific Activities* would be applied. For oil and gas activities, BLM may impose controls on engines (drilling rigs), roads, monitoring devices, haul vehicles, noise, and sources of VOCs (condensate tanks, dehydrators, separators). Controls on engines can directly impact (lower) visibility impacts, which are often a leading concern. To reduce fugitive dust on roads, watering, graveling, applying surfactants, paving, inducing speed limits, and/or restricting vehicle access are control measures commonly implemented by BLM. Graveling can provide up to 85% reduction in fugitive dust; paving can provide even more. A reduction in levels of fugitive dust, particulate and combustion emissions can be achieved by imposing a combination of control measures and technologies.

The SJVUAPCD requires all construction work (earth moving) to follow rule eight which details requirements for PM10, PM2.5, and fugitive dust minimization. Dust control measures discussed in Regulation VIII Rules, include (but are not limited to) frequent watering, paving of access roads, and periodic road washing in construction areas. More specifically under rule 8021, any project that is over 5 acres in non-residential areas will need to have a dust control plan that details particulate matter minimization (www.valleyair.org).

Projects less than 5 acres are considered by the SJVUAPCD as insignificant in regards to PM10 and PM2.5 emissions. Based on the RFD associated with the proposed action, total disturbance will be approximately 1.0 acre for one well; therefore the proposed action will not result in particulate emissions levels that substantially impact air quality. According to the SJVAPCD, implementation of and compliance with Regulation VIII will effectively reduce emissions and air quality impacts from the project. In addition, implementation of existing regulatory requirements (SJVAPCD Rule 2201) requires any emission increases above specified levels to be offset. Therefore, by complying with existing regulatory requirements and implementing BMPs to reduce emissions, the decision to lease the proposed parcels would not result in a substantial increase in emissions. Potential impacts to air quality are not expected to prevent timely attainment of federal air quality standards.

Conformity:

The US EPA general conformity rules require federal agencies to determine whether a proposal conforms to the existing SIP(s). EPA rules state that a formal analysis is not necessary when the total emissions do not exceed *de minimis* levels, and comply with the SIP. Since the expected emissions are clearly *de minimis*, no further conformity analysis is necessary; furthermore, this is consistent with SJVAPCD Rule 9110.

Climate Change

The California Global Warming Solutions Act of 2006 (AB 32) is one of the first laws in the United States that mandates regulation of greenhouse gases at a state level. In April 2009, the U.S. Supreme Court ruled that the EPA has the authority to regulate GHGs under the Clean Air Act (Massachusetts vs.

EPA, 05-1120). It is anticipated that, as more information becomes available, and as California moves to implement the greenhouse gas regulations under the California Global Warming Solutions Act of 2006 (AB-32), additional restrictions will be placed on all activities, including those associated with the drilling and production of oil wells in the Southern San Joaquin Valley. All current and future operations on federal lands will be subject to those requirements.

As described in Chapter 3, the DOI is exploring whether global and regional climate modeling can be scaled to the point that it can be used to manage parks and refuges.[2] Secretarial Order 3289 was issued in 2009[3] which directs each bureau to:

> "consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, and/or when making major decisions affecting DOI resources."

With respect to climate change, climate plays a significant role in the production of ozone. Sunlight and high temperatures are a major catalyst in reactions between VOCs and NOx in the production of ozone. With an increase in overall temperature, we can expect to have more hot days and less precipitation that will lead to a higher production of ozone.

The primary sources of greenhouse gases associated with oil and gas exploration and production are carbon dioxide (CO_2) and methane (CH_4). In addition, nitrous oxide (N_2O) and VOCs are indirect air pollutants that contribute to ozone production and aid in prolonging the life of methane in the atmosphere. GHGs are produced and emitted by various sources during phases of oil and gas exploration, well development, production, and site abandonment. The American Petroleum Institute (API) categorizes sources of emissions from all oil and gas operations into the following classifications[4]:

Direct Emissions

Combustion Sources – includes stationary devices (boilers, heaters, internal combustion engines, flares, burners) and mobile devices (barges, railcars, and trucks for material transport; vehicles for personnel transport; forklifts, construction equipment, etc.)

Process Emissions and Vented Sources - includes process emissions from glycol dehydrators, stacks, vents, ducts; maintenance/turnaround; and non-routine activities such as pressure relief valves, emergency shut-down devices, etc.

Fugitive Sources- includes fugitive emissions from valves, flanges, pumps, connectors, etc.; and other non-point sources from wastewater treatment

Indirect Emissions

Emissions associated with company operations, such as off-site generation of electricity, hot water or steam, and compression for on-site power, heat and cooling.

Direct and indirect GHG emissions may occur from various sources during each phase of exploration and development. During exploration and development, emissions are generated from well pad and access road construction, rigging up/down, drilling, well completion, and testing phases. GHG emissions for

[2] GAO-07-863, 2007

[3] Secretary of the Interior Order 3289, September 14, 2009

[4] American Petroleum Institute, Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry; August 2009.

these phases are mainly CO2 emissions from fuel in internal combustion engines of diesel trucks, equipment, and rigs. However, as Zahniser (date unknown) noted in the *Characterization of Greenhouse Gas Emissions Involved in Oil and Gas Exploration and Production Operations, Review for the California Air Resources Board*, an additional one-time and potentially long term effect could include carbon sinks lost due to surface and vegetation disturbance associated with well site development. In the first phase of a national assessment, USGS found that the conterminous U.S. presently stores an estimated 73 billion metric tons of carbon in soils (USGS 2009); soils could serve as a sink, by removing additional quantities of carbon dioxide (CO_2) from the atmosphere, as a means to mitigate climate change.

Nearly 87% of U.S. greenhouse gas emissions come from energy production and use (Karl et al. 2009). Oil and gas extraction/supply accounted for 3% of existing 1990 emissions estimates (total gross emissions of 433.28 MMT CO2e) (CARB 2007). The total emissions for equipment covered under the CARB 2007 Oil and Gas Industry Survey are estimated to be 18.8 million metric tons of CO2e. Combustion sources (equipment burning fuel for energy) account for 87 percent of the total CO2e emissions, while the remaining 13 percent of the CO2e emissions come from vented and fugitive sources (CARB 2011). Based on this industry survey, nearly 76% of the statewide total CO2e emissions for these operations occur in the San Joaquin Valley APCD.

There is no generally accepted guidance for determining significance of project specific GHG impacts (SJVAPCD, 2009a). There are currently no federal or State thresholds adopted for GHG emissions. The SJVAPCD recognizes that project proponents, lead agencies, the District and the public need clear guidance; therefore, the District Board has recently directed staff to develop guidance for addressing GHG impacts. The District proposes that projects not implementing Best Performance Standards (BPS) must quantify GHG emissions and reduce or mitigate GHG emissions (by 29% to be less than significant). Developing Performance Based Standards will streamline the significance determination process. The policy for addressing GHG emissions impacts for stationary source projects indicates that the need to quantify project specific impacts is negated if emissions reductions are achieved by implementing BPS (SJVAPCD 2009b). This approach is based on the use of BPS and their associated, pre-quantified GHG emission reduction effectiveness.

As part of CARB's efforts to establish a baseline GHG emissions inventory, they are still in the process of developing protocols to quantify fugitive and vented emissions. GHG emissions can be calculated for well drilling and maintenance activities. At this time there are emissions calculations for CO2 and CH4 from well workovers and cleanups. However, there are currently no calculations or emissions factors for determining GHG emissions from new wells drilled or well completions (CARB 2011). Consequently, no estimates of GHG emissions are available for the proposed action.

For this analysis, the RFD predicts that one well will be drilled as a result of the proposed action. The current leasing proposal represents less than 0.05 percent of the annual new well activity for the area and a much smaller fraction of the existing well population. Emissions from the construction of one well would be expected to be lower than the national average because of vapor recovery systems and other pollution controls (Best Performance Standards) mandated by the San Joaquin Valley APCD; values for GHG emissions are expected to follow a similar pattern. Thus, direct GHG emissions from the proposed action would be undetectable on a nationwide basis and would be expected to have a negligible influence on global climate change. This is consistent with the SJVAPCD conclusion that existing science is inadequate to support quantification of impacts that project level GHG emissions would have on global climate change (SJVAPCD 2009b).

Pursuant to Title 17 California Code of Regulations, Sections 95100-95133, an operator will be responsible for reporting its GHG emissions inventory annually to the state ARB to track progress in reaching statewide GHG emission reduction goals by 2020. A federal lessee will be responsible for

implementation of a VOC Leak Standards program, pursuant to SJVAPCD Rule 4401. This Inspection and Maintenance (I&M) program is designed to control fugitive VOC emissions at components such as fittings and valves associated with production and processing equipment. In addition, a lessee is responsible for the operation of its steam generators in compliance with SJVAPCD Rules 4305 and 4306. Controlling fugitive VOC emissions and combustion generated VOC emissions will also control and reduce the amount of potential fugitive methane and combustion related methane emissions associated with the production streams, and thereby reduce potential GHG emissions.

Impacts to Soil Resources

Direct impacts to soils as a subsequent result of leasing may include topsoil removal, mixing, grading, filling, and compaction; all of which reduce soil quality. Erosion is an offsite impact that may present potential water quality issues as a result of increased sediment and nutrient transport. Indirect impacts associated with any lease development may include accelerated erosion following well pad and/or access road construction on slopes and/or other unstable geography. Slopes on Parcels 1-4 do not exceed 30 percent; the risk of erosion on and adjacent to lease parcels is of greatest concern in areas where slopes exceed 40 percent, since the potential hazard of erosion increases as slope increases.

These site-specific impacts will be considered and mitigated on a case-by-case basis using proper well placement and by implementing best management practices (BMPs). To minimize new or additional disturbance and impacts to soil quality, wells and access roads may be sited in areas that are disturbed by past and/or current land use. Overall soil compaction may be reduced by restricting vehicle and equipment use to limited, perhaps previously disturbed areas. Simple erosion control practices will apply, such as minimizing slope gradient, clearing smaller areas of vegetation, and vigilant scheduling of any excavation to avoid rainfall periods. Road(s) designed in accordance with the BLM standards (Manual 9113) will decrease erosion effects, particularly in areas where soil limitations are identified (Parcel 4). Soil impacts may be further reduced by identifying and protecting biological soil crusts; when soil crusts are present these will be conserved and stockpiled to encourage interim restoration subsequent to drilling. Regardless of crust presence or absence, topsoil conservation and replacement is generally used as a Best Management Practice (BMP) to minimize impacts to soil and habitat, thereby increasing the efficiency and success of interim and final site reclamation.

Any oilfield construction project that disturbs 1.0 acre of soil or more will be subject to compliance with the State of California Water Quality Control Board (SWQCB) notification and General Permit requirements for Construction. Furthermore, the intensity of both onsite and offsite effects of soil disturbance can be minimized by implementing basic principles of erosion control on construction sites, such as BLM BMPs, State approved Management Measures (MM's), or EPA's *Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites* (http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm).

Impacts to soils from spills or contamination could cause a long term reduction or loss in site productivity. Some of these direct and indirect impacts can be minimized or avoided through proper design, construction, and maintenance, and by implementing BMPs. In California, oil and gas operators are required to comply with State spill reporting requirements, per the California Office of Emergency Services (OES) and the CDOGGR. In addition, Federal lessees are required to comply with BLM spill reporting and clean up requirements. Any soil contamination resulting from an undesirable event will be removed/mitigated upon discovery; clean up may follow the *Guidelines for Clean-up of Heavy Crude on Federal Leases*.

Impacts to Water Quality

Although there are no rivers, lakes, or streams on the parcels that contain water year round, Devilwater Creek crosses the southern portion of Parcel 1and unnamed, intermittent creeks bisect or cross Parcels 2, 3, and 4. These creeks may support water seasonally, and are otherwise expressed as dry drainages.

No direct impacts to Devilwater Creek or other intermittent streams are expected because BLM will recommend avoiding direct surface disturbance in such areas. A well location and/or access road would be sited in a manner that avoids direct impact or alteration (under BLM standard lease stipulations, a proposed well can be offset up to 200 meters). In the event that any "blue line" drainage cannot be avoided, California Department of Fish and Game notification and/or a Streambed Alteration Agreement (Section 1600) may be required by the lessee/operator.

Indirect impacts to water quality from erosion and increased sediment would be minimized by implementing basic principles of erosion control. Lessee/operator compliance with the SWRCB General Permit for Discharges of Storm Water Associated with Construction Activity (SWRCB Order No. 2009-0009-DWQ) would minimize potential effects to water quality. Surface water quality would be further protected by implementing State approved BMPs (Management Measures) for erosion, the BLM BMPs for Interim Reclamation, and the EPA's *Guidance Document, Reasonable and Prudent Practices for Stabilization (RAPPS) of Oil and Gas Construction Sites* (EPA 2004).

The proposed lease sale parcels are in areas that are generally underlain by groundwater basins. Groundwater (aquifers) will be fully protected by using standard oil field practices and BLM BMPs such as requiring a string of casing to be cemented across all fresh water aquifers. Furthermore, BLM requires compliance with all appropriate laws, regulation, and BLM policies, such as state and federal Clean Water Act(s), Memoranda of Understanding (MOUs) between BLM, EPA, CDF&G, and CDOGGR, and compliance with Regional Water Quality Control Board requirements.

Where there is a threat to water quality or where water quality does not meet state standards, coordination must occur with the regional water quality control board(s). All parcels that contain any water bodies (streams, lakes, springs, etc.) must have adopted BMPs for all activities associated with oil and gas operations that could affect water quality. A list of areas where there are aquifers that are considered to be fresh can be found in Volumes I, II, and/or III of California Oil and Gas Fields, published by the California Conservation Division. Conditions of approval (COAs) will be attached to BLM permit approvals that require protective measures to be taken where spills or other contamination are potentially a concern to surface or ground water.

Floodplains

Parcel numbers 1 thru 3, are within Zone C; areas of minimal flooding. Parcel 4 is within Zone A; areas of 100 year floods.

Regardless of where on the parcel development may be proposed, site-specific NEPA analysis would identify measures to minimize the risk of flood damage to oil and gas facilities/wells and oil spills or other contaminations entering any streams.

Biological Resources Including Riparian and Wetlands

There will be no direct effects to biological resources from offering the parcels for lease.

If a parcel is leased and developed, there could be indirect effects to biological resources from offering

the parcels for lease. From the nearly 300 parcels offered in the past 10 years, 239 parcels have been leased. Of the 239 parcels leased, 43 wells have been drilled on 12 leases. Of the 43 wells drilled, 39 wells on 10 leases were drilled in native habitat. It is estimated that one well could be drilled as a result of offering the parcels for lease. Development of a lease can result in impacts to habitat and species.

All development proposals will be subject to site specific NEPA and ESA review. Species and habitat surveys will be required. Project design criteria, mitigation measures and compensation, similar to those detailed in **Attachment Biology 1. Sample Oil and Gas Programmatic Biological Opinion Provisions** will be required. The CSU Sensitive Species and CSU Protected Species stipulations reserve to BLM the right to delay processing; move, modify or seasonally restrict activities; or prohibit surface disturbing activities on all or a portion of the lease to protect biological resources.

Although the effects disclosed below can result from oil and gas development, the likelihood and extent of such potential impacts from leasing the subject parcels would be reduced because of BLM's site specific NEPA and ESA review. BLM and FWS meet annually to review the effectiveness of project design criteria, mitigation and compensation associated with the BLM administered oil and gas leases. Based on these meetings, changes are made to the BLM program. FWS remains satisfied that BLM is meeting its obligation under the Caliente RMP Biological Opinion and Section 7 of the ESA.

Impacts to Habitat from Oil and Gas Activities

It is estimated that one well may be developed on the offered lease parcels. Development of the well and any associated road and facilities could result in permanent impacts to 1 acre of habitat (Table 2). This potential loss of habitat amounts to < 2% of the smallest parcel (Parcel #4 with 80 acres of private surface) and < 0.2% of the largest parcel (Parcel #1 with 594 acres of private surface). These estimates of habitat loss or alteration are within the range expected and analyzed in the Caliente RMP, EIS Ch. 4 and Biological Opinion.

Of the 1,259 acres, most are presently native or recovered lands (mining exploration scars present in parcels 2&3, disturbance from livestock in parcels 1 & 4). None of the land is under cultivation. If the potential well was developed on native lands this would amount to less than 1% of the native lands offered under this lease auction.

Measures to minimize impacts, such as those contained in Attachment Biology 1. Sample Oil and Gas Programmatic Biological Opinion Provisions would be employed to reduce the amount of habitat impacted. In addition, compensation, in the form of additional habitat protected, would be required. The rate of compensation would range from 1.1 acre (temporary impact) to 4 acres (permanent impact) for every acre disturbed. For new leases offered in the past 10 years of lease sales, 43 wells have been drilled. Thirty-nine of these wells were located in native habitat and resulted in 30 acres of disturbance. The 30 acres of disturbance were compensated with more than 102 acres of compensation habitat.

Impacts to habitat on native lands would depend on the native vegetation type and the topography of the lease parcels. The lease parcels contain a combination of grassland and saltbush scrub vegetation communities. Habitat disturbance in grasslands generally has less of an impact than disturbance in shrublands since shrubs take longer to become re-established. Shrublands also support a greater diversity and number of wildlife species as shrubs provide a high variety of food and cover. As the diversity of habitat structure increases from grassland to shrubland, so does the wildlife species richness. Thus, there is more potential for impacts to wildlife in shrubland, than in grassland communities. The impacts associated with well pads and roads, however, would be very site-specific and are not expected to significantly affect these habitats at the community scale. The footprint of the disturbance is also expected to be a small proportion of the habitat area.

Topography can play a role in the amount of surface disturbance that results from well and road construction. Flat areas will require little or no cut and fill, and road routes are not constrained by topography. In hilly areas, cut and fill may be required which disturbs additional land. Roads routes may have to travel longer distances to meet engineering requirements and may also require cut and fill. Areas lacking roads near potential drilling sites will have more disturbance, as the entire access route will need to be constructed rather than just a short spur route from an existing road.

Approximately 750 acres are with gentle slopes and about 500 acres are with moderate slopes. There are existing roads on all parcels. The hilly portions of the parcels are likely to require new road construction to access well pads unless the wells are located adjacent to existing roads. While many of these lease parcels have one or more existing roads, it is likely that new roads would be required to reach the proposed well pad locations. As the terrain becomes steeper and hilly, more side slope, cut and fill construction may be required. Restoration of side slope, cut and fill pads and roads is more difficult. Impacts in such areas, even if the well is abandoned and the road restored, may persist as altered, but functional, habitat, for several decades.

Habitat restoration also takes longer in shrublands as opposed to grasslands. Grassland habitats may resemble their pre-project conditions in 2 to 5 years. Shrublands may require 5 to 15 years. The parcels in this lease auction are grassland and shrubland habitats that return to their pre-project composition and structure relatively easily and quickly.

Certain type of soils and exposures may take longer to restore. Vegetation on exposed, dry shale areas may be slow to recover. Such areas, however, have naturally sparse vegetation and much exposed soil.

Although the impacts described above can occur as a result of oil and gas development, it is estimated that indirect effect will be limited to 1 well with 1 acre of habitat loss. This would have a localized, moderate effect on habitat in the immediate vicinity of the well and access road, but a negligible to minor impact on habitat within the Southern San Joaquin Valley.

Impacts to Species from Oil and Gas Activities

If a well is developed on the offered lease parcels, impacts to plant and animal species may occur. Measures to minimize impacts, such as those contained in Attachment Biology 1. Sample Oil and Gas Programmatic Biological Opinion Provisions would be employed to reduce the amount of impact, but not all impacts would be avoided.

Potential impacts to plants include direct mortality from earth excavation or crushing by vehicles. Adverse impacts could also result from soil erosion resulting in loss of the supporting substrate for plants, or from soil compaction resulting in reduced germination rates. Impacts to plants occurring after seed germination but prior to seed set could be particularly harmful as both current and future generations would be adversely affected. Weeds which are introduced and/or promoted by soil disturbing activities compete against and displace native vegetation.

Development associated with oil and gas activities has the potential to affect rare plants. Soil disturbing activities directly affect species by destroying habitat, churning soils, impacting biological crusts, disrupting seedbanks, burying individual plants, and generating sites for undesirable weedy species. Weeds may be introduced during construction and operation of the lease. Roads generate weedy habitat along their edges, as well as avenues for weed invasion into unoccupied territory. Dust generated by construction activities and travel along dirt roads can affect nearby plants by depressing photosynthesis, disrupting pollination, and reducing reproductive success. Oil or other chemical spills could contaminate soils as to render them temporarily unsuitable for plant growth until cleanup measures were fully implemented. If cleanup measures were less successful, longer term impacts could be expected.

A variety of project design features and minimization measures are typically employed to reduce impacts to plant species and populations. Typical measures are contained in Attachment Biology 1. Sample Oil

and Gas Programmatic Biological Opinion Provisions. Previously disturbed lands are used as much as possible and the project footprint is minimized. Shrubs and sensitive plant species populations are avoided whenever possible. If sensitive areas cannot be avoided, work is completed after seed set and before germination.

Potential impacts to animals, including listed species, include direct mortality or injury, loss of dens or burrows, displacement, and human disturbance. Direct mortality or injury could result from vehicle strikes, or from collapsed dens and burrows resulting in animals being crushed or entombed. Burrows and dens could be destroyed or damaged by vehicle traffic, particularly heavy equipment. Animals could be displaced during project activities. Such displacement of animals into unfamiliar areas could increase the risk of predation and increase the difficulty of finding required resources such as food and shelter. Human disturbance could result in displacement of animals, even though dens and burrows may not be directly impacted. Human disturbance also might alter the behavior of animals (e.g., activity periods, space use) resulting in increased predation risk, reduced access to resources, and reduced breeding success. Project activities during the spring breeding season could increase the potential for adverse impacts. Animals could also become entrapped in oil spills, leaks, sumps or improperly maintained well cellars or other facilities.

A variety of project design features and minimization measures are typically employed to reduce impacts to individual animals and populations. Typical measures are contained in Attachment Biology 1. Sample Oil and Gas Programmatic Biological Opinion Provisions. Speed limits and employee education are employed to reduce the likelihood of vehicle strikes. Dens are monitored and when vacant, excavated or temporarily blocked to prevent entrapment of animals. Pipes and culverts are searched before being moved or sealed. Biological monitors are required to assist crews and trouble shoot unexpected situations.

Roads and large areas of disturbance can be a barrier to movement for some animal species. Animals in the San Joaquin Valley suite of sensitive animal species, however, generally do not have difficulty crossing roads or disturbed areas. It is not unusual to observe kangaroo rats, kit foxes, antelope squirrels or blunt-nosed leopard lizards using and- crossing roads. This tendency does expose these animals to vehicle strikes, especially on paved roads with higher vehicle speeds. The impact of roads, large areas of disturbance, barriers and vehicle strikes is within the range analyzed in the Caliente RMP, EIS Ch. 4 and the Caliente RMP Biological Opinion.

Structures such as utility poles, buildings, and pumping units may provide perches for raptors. Addition of such structures in flat terrain may increase predation rates on small mammals and other prey species. The types of structures typically found in oilfields, however, do not tend to provide nesting structures for raptors, including ravens. Introducing nesting structures can have a greater impact on prey species since much more prey is taken by raptors that are rearing young, and the nest site is continuously occupied for the season increasing the duration and frequency of the predation effect. The effect of introducing structures that will only serve as perches is not expected to be significant as such perches are likely to only occasionally be used for hunting.

BLM utilizes a double review process for leasing and development of oil and gas. At the leasing stage a comprehensive NEPA and Biological Opinion addresses leasing and potential development. The March 31, 1997 Caliente RMP Biological Opinion serves as the comprehensive Biological Opinion for leasing, including the proposed action. Should a development proposal actually be submitted, BLM then completes a site specific NEPA and ESA review. If the development proposal may affect listed species, a secondary formal consultation is completed before approving the development.

If a project may affect listed species, a secondary consultation will be required. In 2001 BLM completed the Oil and Gas Programmatic Biological Opinion (O&G Programmatic BO). Development projects which meet certain criteria may be authorized under the O&G Programmatic BO. If the project does not

meet the O&G Programmatic BO criteria, a separate consultation will be completed. The requirements of the separate consultation are likely to be similar to those contained in the O&G Programmatic BO.

Under the Oil and Gas Programmatic Biological Opinion, listed species and habitat surveys are required prior to BLM authorizations and surface disturbing activities. Habitat features used by listed plants and animals, special status plant populations, and important habitats are avoided as required in the O&G Programmatic BO. Direct incidental take is avoided for San Joaquin kit fox and blunt-nosed leopard lizards, and direct take is avoided to the greatest extent practicable for the other listed animals species (rarely resulting in direct take). Impacts to the habitats supporting these species are mitigated through the O&G Programmatic BO's requirement that "compensation habitat" be acquired and managed as habitat in perpetuity in an agency-approved off-site location. The O&G Programmatic BO requires that three acres be acquired for each acre subject to permanent disturbance and 1.1 acres be acquired for each acre of temporary disturbance. Beginning in October 2008, BLM also agreed to require a 4:1 compensation ratio for permanent habitat disturbance within the Western Kern County Kit Fox Core Area. The O&G Programmatic BO also requires that each acre of BLM listed species habitat on federally owned surface be "replaced," acre for acre, since the BLM lands are considered conserved lands by the Recovery Plan and Draft Kern Valley Floor Habitat Conservation Plan. Typical survey requirements, project design criteria, mitigation and compensations requirements for BLM authorized projects are included in **Attachment Biology 1. Sample Oil and Gas Programmatic Biological Opinion Provisions**.

In addition to site- specific NEPA and ESA review, all new oil and gas leases would be subject to the "Controlled Surface Use – Protected Species" and "Controlled Surface Use – Sensitive Species" stipulations. The CSU Sensitive Species and CSU Protected Species stipulations reserve to BLM the right to delay processing; move, modify or seasonally restrict activities; or prohibit surface disturbing activities on all or a portion of the lease to protect biological resources. Leasing of lands under these constraints will provide strong protection for protected species and special status species.

Although the impacts described above can occur as a result of oil and gas development, it is estimated that indirect effects will be limited to 1 well with 1 acre of habitat loss. This would have a localized, moderate effect on individual animals in the immediate vicinity of the well and access road, but a negligible to minor impact on populations within the Southern San Joaquin Valley. These potential impacts are within the range analyzed in the Caliente RMP, EIS Ch. 4 and the Caliente RMP Biological Opinion.

Effects to Federally Listed and Proposed Species, and Critical Habitat

Several federally listed species (San Joaquin woolly-threads, Bakersfield cactus, blunt-nosed leopard lizard, giant kangaroo rat, and San Joaquin kit fox) may occur on or in the vicinity of all of the parcels. In addition, the recently delisted Hoover's woollystar may occur on or in the vicinity of all of the parcels. If exploration or development occurs on one of these parcels, the proposed action may affect listed species.

Section 7 of the Endangered Species Act requires a federal agency to complete Formal Consultation with the USFWS prior to undertaking an action which may affect a listed species. Formal Consultation addressing the impacts of oil and gas leasing, exploration and development, to these species, was completed on March 31, 1997 (Caliente RMP Biological Opinion 1-1-97-F-64). The U.S. Fish and Wildlife Service concluded that oil and gas leasing, exploration and development, as proposed by the Caliente RMP, was not likely to jeopardize the continued existence of these species. As a condition of the Caliente RMP and other biological opinions, BLM and FWS meet annually. Based on these meetings, changes are made to how BLM administered its programs to comply with the various biological programs and its responsibilities under the Endangered Species Act. FWS remains satisfied that BLM is meeting its obligation under the Caliente RMP Biological Opinion and Section 7 of the ESA.

The proposed action is in compliance with the Caliente RMP, and thus, is consistent with the March 31, 1997 Caliente RMP BO. Should an exploration or development proposal be submitted for any of these leases, it will be subject to additional site specific ESA review as described above.

There will be no effect to critical habitat as none of the parcels include designated or proposed critical habitat.

Relationship to San Joaquin Valley Endangered Species Recovery

The conservation and recovery strategy outlined in the *Recovery Plan for Upland Species of the San Joaquin Valley* (USFWS 1998) defines a system of reserves and corridors. In the Caliente RMP, BLM committed to managing all BLM lands within these reserves and corridors as part of the conservation and recovery system. These lands are managed to maintain 90% of the habitat in reserves and 75% of the habitat in the corridors. Restoration is undertaken on lands that do not meet the habitat maintenance goal before new development is authorized. BLM also requires mitigation and compensation for development activities. Disturbance of habitat is compensated at a rate of 1.1 acre for every acre temporarily disturbed, and 3 acres for every acre permanently disturbed. In addition, disturbance to BLM surface requires an additional replacement factor of 1 acre for every acre disturbed and disturbance within the Western Kern County Kit Fox Core Area requires a 4:1 compensation ratio. Species surveys, avoidance of habitat features and implementation of measures to minimize take are also standard requirements. These requirements were put in place to implement the Recovery Plan and to meet the BLM's obligation under Sections 7(a)1 and 2(c) of the Endangered Species Act to conserve listed species.

BLM's program for the management of reserve and corridor lands has been reviewed and approved by the USFWS as part the Caliente RMP Biological Opinion 1-1-97-F-64 and more recently in the Oil and Gas Programmatic Biological Opinion 1-1-01-F-0063. In these Biological Opinions, the Service concluded that the BLM's program was not likely to jeopardize the continued existence of a listed species and is in compliance with Section 7(a)2 of the Endangered Species Act.

Of the lands offered in this sale, the entire 1,259 acres are within corridors (green zone). The RFD estimates that 1 well with 1 acre of habitat disturbance could result from this lease sale. Any disturbance would be subject to the survey, avoidance, mitigation, compensation and replacement requirements described above. All acres within the Temblors and Buena Vista Units are within the Western Kern County core kit fox population. Given these restrictions, the limited amount of habitat that will be disturbed (1 acre), and the localized nature of the impact (immediate vicinity of one well and access road), indirect effects associated with this lease sale are expected to be compatible with the Recovery Plan and conservation and recovery strategy.

Species Specific Impacts

Table Biology 1 and Table Biology 2 lists the Federally listed, state listed and BLM sensitive species with the potential to occur on the offered lease parcels.

Federally and State Listed Species

San Joaquin wooly-threads. There is potential for San Joaquin wooly-threads to be found within the Temblors Unit. To the greatest extent possible, BLM would require populations to be avoided. Otherwise, measures, such as delaying surface disturbance until after seed set, collection of seed, reseeding, and stockpiling of topsoil, may be required to minimize impacts. This is currently required by the O&G Programmatic BO and would likely be required in any separate consultation.

Hoover's woollystar. Hoover's woollystar may be found on all units. Hoover's woollystar could be adversely impacted by earth excavation, off-road vehicle traffic, erosion and spills. It is projected that the post-leasing activities will result in temporary or transient habitat disturbance. Hoover's woollystar can quickly colonize disturbed areas and is expected to re-colonize temporary or transient disturbance areas. Survey and avoidance measures will also be implemented for Hoover's woollystar to further minimize impacts to this species.

Blunt-nosed leopard lizard. Blunt-nosed leopard lizards may occur within all units. Potential impacts to blunt-nosed leopard lizards include direct mortality, loss or alteration of habitat, and harassment. Blunt-nosed leopard lizards are active during the day, which enhances the threat of some impacts, such as vehicle strikes. Project activities could destroy burrows used by blunt-nosed leopard lizards. Lizards can become entrapped or buried inside destroyed burrows as well. Discharge of waste water could drown lizards using drainages. Lizards can become entrapped or drown in oil or tarry substances. Improperly covered well cellars, buried valve boxes, buckets and vertical pipe sections can act as pitfall traps and entrap lizards. BLM would require pre-construction surveys and implementation of mitigation measures to reduce the potential for these impacts. Example measures include, installing flashing around the project footprint, protocol level survey prior to habitat disturbance and burrow destruction, escorting vehicles through blunt- nosed leopard lizard activity areas, and scheduling activities for time periods when blunt-nosed leopard lizards are not active. Such measures are currently required by the O&G Programmatic BO and would likely be required in any separate consultation. BLM lease operating standards (e.g. waste water discharge policies, proper maintenance of equipment and facilities, etc.) will also reduce the potential for these impacts.

Giant kangaroo rat. Giant kangaroo rats may occur within all units. Potential impacts to this species include direct mortality, loss of burrow systems, loss or alteration of habitat, and harassment. The construction and maintenance of wells pads, access roads, pipelines, and other oil field structures may trap or bury kangaroo rats in their burrows. Kangaroo rats can also drown or become entrapped in spilled oil or tarry substances. Kangaroo rats may be killed by vehicles. Burrows can be damaged or destroyed by project activities. Some habitat may be lost or altered. Studies conducted by Spiegel (1996) indicated that kangaroo rat abundance was lower in oilfield-developed sites compared to undeveloped sites. This was attributed to lower carrying capacity due to habitat alteration and fragmentation. However, the amount of oilfield habitat disturbance was much greater (in excess of 70%) than is expected to result from the leasing of these parcels (less than 1% surface disturbance).

Because giant kangaroo rats have the potential to occur in all units, BLM would require pre-construction surveys and implementation of mitigation measures to reduce the potential for impacts. Examples include, trapping to temporarily remove animals from the construction site, and designing project footprints to avoid burrows when possible. Such measures are currently required by the O&G Programmatic BO and would likely be required in any separate consultation. Pre-construction surveys and implementation of mitigation measures that are part of the Oil and Gas Programmatic Biological Opinion will reduce the potential for impacts. Giant kangaroo rats are mostly active at night and most vehicle traffic is expected during daylight hours. This combination will reduce the chances of a vehicle strike. Giant kangaroo rats would be avoided and the low amount of habitat disturbance would have negligible affects to any kangaroo rat species inhabiting the area.

San Joaquin kit fox. San Joaquin kit fox may occur within all units. Potential impacts to San Joaquin kit fox include direct mortality from vehicle strikes, accidental entombment, drowning or entrapment in spilled oil or sumps, entrapment in pipes, and entrapment in old well cellars. Construction of well pads, roads, pipelines, and facilities result in alteration and fragmentation of habitat, loss of den sites and features, and loss of habitat to support prey species. Oilfields are often places of continual human disturbance from well drilling, maintenance, and monitoring, operation of production facilities, transportation of produced oil, and associated industrial activities. There is also exposure to oil field chemicals around production facilities and from unintentional events (e.g., spills, well head and pipeline leaks, well blow-outs). However, the incidence of these causes of mortality, sickness, and habitat loss are avoided and ameliorated by the implementation of biological surveys prior to new authorizations, take avoidance, project mitigation, terms and conditions of biological opinions, best management practices, spill avoidance and cleanup measures, and habitat restoration of disturbed sites. For example, new well pads, roads and pipelines locations and routes are surveyed for kit fox dens and these projects may be moved to a distance approved by the FWS and CDFG to preserve the den site and minimize disturbance to foxes that may be present. The projects may be relocated onto previously disturbed sites to minimize habitat alteration. Facilities are inspected to ensure that oil leaks are remediated, well cellars are covered, and sumps are covered or removed. Speed limits are posted, and enforced under company health and safety standards. Employee training of endangered species features, habitat, avoidance and mitigation measures, required conservation measures, and reporting are included in employee and contractor project orientation.

Studies of San Joaquin kit fox in oilfield landscapes in western Kern County have evaluated the effects of oil and gas land uses on this species. Spiegel (1996) compared several life history traits of San Joaquin kit fox (e.g., den characteristics, diet, spatial ecology and habitat use, reproduction, mortality, relative abundance, and prey relative abundance) in undeveloped, moderately developed and intensively developed oil fields. The moderately developed site was had variable amounts of disturbance from 0% to 50% disturbance, with the intensively disturbed site having >70% disturbance. This study, conducted between 1989 and 1993, found that the abundance of San Joaquin kit fox was 50% higher in undeveloped areas compared to the moderate development and high intensity oilfield sites. The relative abundance and biomass of prey species was also greater in the undeveloped site. Within the oilfield sites, prey species were more diverse than in the undeveloped site. Kangaroo rats were more frequently used in undeveloped sites but rabbits/hares, pocket mice, deer mice, and house mice were used more frequently in the developed sites. The diets were reflective of prey availability of the different areas. Atypical dens (pipes, culverts, woodpiles) accounted for 50% of the den sites in the developed sites, while only 15% were atypical dens in the undeveloped site. Dens in developed sites were usually <5 meters from a human-related disturbance. Habitat features associated with den locations were typical of those most available. Activities associated with oilfield production did not appear to affect kit fox survivorship or reproduction. Reproductive success and litter sizes did not differ between developed and the undeveloped sites. However, the cumulative survivorship of young foxes was higher in the undeveloped area. Predation accounted for 88.9% of deaths during this study, with only one death attributable to oil-related activities. The mortality risk to kit foxes from exposure to oil in the developed area was considered minimal. There was a lack of vehicle-related mortality during the study which was attributed to reduced speed limits in the developed area. This study also found that foxes in the developed areas were able to maintain smaller home ranges than foxes from the undeveloped site, presumably due to the availability of human-derived food sources widely dispersed throughout the oilfield. Disturbed sites were used in proportion to that available which was attributed to the presence of prey adapted to disturbed sites. Denning ranges and high activity areas in the developed site contained disturbed habitat in amounts greater to that available, which was likely related to the extensive use of pipe dens. This study concluded that the opportunistic nature of kit foxes allows them to persist in oil-developed areas, provided that adequate foraging resources and denning opportunities exist. The most significant effect of oil development on kit fox populations appears to be lower carrying capacity for populations of both foxes

and their prey from reduction of habitat (about 28% vegetative cover) and fragmentation of habitat caused by oilfield-related construction and maintenance activities.

A more extensive and longer term kit fox study in an oilfield landscape was conducted at the Naval Petroleum Reserves, California (NPRC) from 1980 to 1985. At this study, a site was considered developed if disturbance was >15%; the undeveloped sites averaged 7.8% disturbance and the developed sites averaged 25.8% disturbance. Cypher et. al. (2000) found that kit fox capture rates were higher in the undeveloped areas than in the developed area, but these rates exhibited similar trends and were related. Survival rates were higher in developed areas during 1980 -1986, but rates declined in both areas during that period. Deaths attributed to various causes were similar in developed and undeveloped areas. Juvenile survival rates were similar in developed and undeveloped areas as were the causes of deaths. Of 712 dead foxes, 43 died from oilfield-related causes; of these 35 hit by vehicles, 1 accidentally entombed, 3 drowned in spilled oil, 1 drowned in an oil sump, 2 entrapped in pipes, and 2 died entrapped in a well cellar. Reproductive success among adult and juvenile kit fox and litter size did not differ between developed and undeveloped areas. The abundance of rabbits and hares (leporids) was always lower in the undeveloped areas while the mean capture of all rodents and kangaroo rats was higher in the undeveloped areas. In both the developed and undeveloped areas the kit fox use of leporids declined while the use of kangaroo rats increased. The use of leporids was higher in developed areas with the use of kangaroo rats higher in undeveloped areas. Predators were the primary cause of mortality at NPRC. Vehicles did not appear to be a significant source of mortality due to the relatively low percentage of occurrence. Oilfield activities did not appear to significantly affect the population dynamics of kit foxes at NPRC. Fox abundance was usually lower in developed areas, but trends in developed and undeveloped areas were similar, indicating that the same factors were influencing population dynamics in both areas. Relatively few foxes died on NPRC as a direct result of oilfield activities. The majority of these animals were accidentally hit by vehicles, but the frequency is probably similar to that on roads off-site and was possibly lower due to reduced speed limits. The exposure to toxic chemicals was detected among some kit foxes, but levels and occurrence rates were not considered to negatively impact the population. Hematological values did not differ between foxes in developed and undeveloped areas. Individual foxes used an average of 11.8 dens each year and over 1,000 dens were located on NPRC, so den availability is probably not a limiting factor. Den use patterns were similar among developed and undeveloped areas. Space-use patterns of foxes were not affected by oilfield activities. Nightly movements and home range patterns were similar in developed and undeveloped areas. Disturbances associated with oilfield activities did not appear to affect kit foxes which were observed around facilities and frequently man-made structures as dens. Dens were frequently located near disturbances (roads, pipelines, disturbed habitat). This study concluded that in general, kit foxes appear to be tolerant of human activity and exhibit an ability to coexist with humans, even in areas of intense disturbance. The most significant impact to foxes from oilfield activities probably is habitat loss associated with facility construction and concomitant reduction in carrying capacity. Based on results from NPRC and elsewhere, kit foxes are able to adapt to oilfield activities and persist in areas of oil development.

Both studies indicated that while many of the kit fox population and life history characteristics were similar between areas developed for oil and gas and those undeveloped, there were fewer foxes or captures in the developed areas. This is likely due to reduced carrying capacity that is the result of habitat alteration and fragmentation. Both of the oil and gas developed study sites were at levels of disturbance far in excess of what is projected to result from this lease sale. Considering the small amount of habitat disturbance projected to occur as a result of leasing these parcels and the site-specific NEPA analysis and ESA compliance measures, the risk of impacts to an individual San Joaquin kit fox is very unlikely. BLM would require pre-construction surveys and implementation of mitigation measures to reduce the potential for these impacts. Example measures include monitoring of potential dens prior to excavation, complete avoidance of natal dens during the pupping season, speed limits, trash containment and removal, and checking pipes and culverts prior to moving. Such measures are currently required by the O&G Programmatic BO and would likely be required in any separate consultation. Thus, with implementation

of avoidance and mitigation measures required at the site-specific project stage, little impact is likely to occur to individual kit foxes and no effects would be likely at the population level as a result from the oil and gas activities on these leases.

All acres within the Temblors and Buena Vista Units are within the Western Kern County core kit fox population. The U.S. Fish and Wildlife Service identified three core populations as important for kit fox recovery. One goal for the core populations is to protect natural lands with appropriate land use and management. The U.S. Fish and Wildlife Service has indicated that they are concerned about the low amount of habitat conserved within the Western Kern County core population. All of the 1,259 acres are native lands, although they do contain roads and evidence of past mining exploration disturbance. It is estimated that 1 well and 1 acre could be developed. This could result in localized and limited disturbance to kit fox habitat. As described above, disturbance to kit fox habitat is compensated at a rate of 1.1 acre for every acre temporarily disturbed, and 3 acres for every acre permanently disturbed. In addition, disturbance to BLM surface requires an additional replacement factor of 1 acre for every acre disturbed and disturbance within the Western Kern County Kit Fox Core Area requires a 4:1 compensation ratio. Compensation would not be required for the cultivated farm lands. Species surveys, standard kit fox mitigation measures, avoidance of habitat features are also standard requirements. Survey and take avoidance measures would be implemented on the farm lands to ensure that kit fox dens that may occur on the margins of the farm fields or within fallowed farm fields would be avoided. The habitat loss of one acre is not expected to conflict with recovery plan goals. In addition, individual projects are expected to be relatively small (less than one acre on average) compared to the home range of a kit fox (average 1,144 acres) and widely dispersed over space and time.

San Joaquin Antelope Squirrel. San Joaquin antelope squirrel have the potential to occur in all units. Impacts to the San Joaquin antelope squirrel would be similar to those described for the giant kangaroo rat. Antelope squirrels are, however, more widely distributed and are more likely to occur on or near a project site than giant kangaroo rats. BLM would require pre-construction surveys and implementation of mitigation measures to reduce the potential for these impacts. Example measures include monitoring for antelope squirrel activity patterns, avoidance of potential burrows, hand removal of shrubs to increase visibility, checking below vehicles and equipment, and destruction of potential burrows only when animals are observed to be away from the burrow. Such measures are currently recommended to operators as part of the O&G Programmatic BO. These measures are currently being reviewed by the California Department of Fish and Game (CDF&G). Compliance with these measures will minimize impacts to antelope squirrel.

BLM Sensitive Animal Species

Burrowing Owl. The burrowing owl has the potential to occur in all units. Potential impacts to burrowing owls include loss of burrows, entrapment in burrows, and collision with vehicles. Burrowing owl burrows would be treated like potential kit fox dens. Such dens would be monitored for use before destruction or plugging, allowing detection of burrowing owl use. If owl use if detected and the burrow cannot be avoided, burrow destruction or plugging would occur only after the owl has vacated the site. As a result some burrows sites may be lost, but individual owls should avoid becoming entrapped inside burrows.

Short-nosed kangaroo rat. Impacts to short-nosed kangaroo rats would be similar to those described for the giant kangaroo rat. Short-nosed kangaroo rats are also widely distributed, and like the antelope squirrel, are more likely to occur on or near a project site than giant kangaroo rats. Short-nosed kangaroo rats have the potential to occur in all units.

San Joaquin pocket mouse and Tulare grasshopper mouse. The San Joaquin pocket mouse and the Tulare grasshopper mouse have the potential to occur on all units. Impacts to these species would be similar to those described for the giant kangaroo rat. Burrows of small mammals would be avoided to the

extent practicable, but some impacts to these two species would likely occur. Considering the small amount of habitat expected to be disturbed during the construction of one well, the site-specific impacts would be minor and the impacts to populations would be negligible.

Pallid bat. The pallid bat has the potential to occur in the all units. Impacts to the pallid bat are not expected as roost sites (rocky grottos, buildings, mines) are not expected to be impacted by development activities and very little foraging habitat would be altered.

BLM Sensitive Plant Species.

Seven of the eight BLM sensitive plants identified as having the potential to occur are annual species. As such, populations are not always easy to identify, especially given the high yearly variation in precipitation and the annual plants' response. Because of this, a single year's survey may not adequately identify existing population boundaries and, thus, development may inadvertently destroy existing, but unidentified sensitive plant habitat and populations (i.e., seed banks). Impacts would be dependent on the location of the disturbance relative to populations of the species in question. The construction of roads, well pads, and similar development could destroy plants or disrupt continuity between populations. New weedy species could be introduced and weeds would benefit from the additional moisture generated by runoff from roads and pads. To minimize impacts to BLM sensitive species, mitigation measures would consider the type of impact, the rareness of the species, the population size and distribution, and the species' response to disturbance. Heavy grazing on some parcels may further complicate the identification of rare plant population boundaries

Indirect Effects to Biological Resources as a result of Climate Change

Since the level of greenhouse gas associated with the proposed action (possible 1 well) is not expected to detectably influence climate change, indirect effects to biological resources are not expected. The effects to biological resources from climate change are discussed instead under cumulative effects.

RIPARIAN AND WETLAND HABITAT

Because there is no riparian habitat within these units, there would be no impacts to riparian habitat as a result of this lease.

Indirect Effects to Biological Resources as a result of Climate Change

Since the level of greenhouse gas associated with the proposed action (possible 1 well) is not expected to detectably influence climate change, indirect effects to biological resources are not expected. The effects to biological resources from climate change are discussed instead under cumulative effects.

Cultural Resources

Approval of this document will have no adverse effect upon cultural resources through compliance with Section 106 of the National Historic Preservation Act and with the Supplemental Procedures for Fluid Minerals Leasing, an amendment to the State Protocol Agreement between California Bureau of Land Management and the California State Preservation Officer and the Nevada State Historic Preservation Officer. These Supplemental Procedures state that a Class I record search and Tribal consultation will be considered adequate inventory and identification methodology for the purposes of fluid minerals decisions at the leasing stage. This proposal and analysis deal only with the action of leasing, and does not consider ground disturbing activities. Any subsequent realty or oil and gas projects or development will be subject to a separate NEPA document and compliance with Section 106 of the National Historic Preservation Act. As oil and gas development actions or associated realty actions are proposed, the areas

of potential effect (APE) will be defined and assessments of the impacts upon cultural resources will be undertaken. NEPA and Sec. 106 compliance will be completed on all undertakings. In the event that cultural resources are identified within a project area, an evaluation of significance will occur and steps will be taken to mitigate impacts to that resource. Mitigation most frequently involves site avoidance, but may include data recovery though excavation. It should be noted that BLM has discretional control over mitigation stipulations and/or avoidance measures imposed on a project. Although a lessee has a right to develop a lease, BLM may require development activities to be moved up to 200 meters in any direction. This should allow nearly all sites to be avoided. Sites that cannot be avoided will be evaluated for listing on the National Register and mitigation measures will be instituted if the site is found eligible. Should development uncover subsurface sites, the lessee is required to halt all work until the site can be evaluated and proper mitigation and avoidance measures identified.

A record search for the occurrence of any known prehistoric or historical period cultural sites was completed for all four of the proposed lease parcels. None of the lease parcels have been previously surveyed for the presence of archaeological remains, and there are no known archaeological sites within the boundaries of the proposed lease parcels. As described above, prior to any future development within these proposed lease parcels, a Class III complete coverage field survey for project APEs will be completed for those areas not previously inventoried or those which have been judged inadequately surveyed in the past. Impacts as a result of proposed project activities to any sites identified during the course of these inventories will be addressed through the procedures outlined above.

Native American Values

Certified letters containing a description of the March 2012 oil and gas lease sale and maps showing parcel locations were mailed to members of the Native American community and federally recognized tribes known to have ancestral ties to the lease parcel areas. In this letter, the BLM requested information regarding sites of traditional cultural or religious value which may lie within the boundaries of the listed lease sale parcels. The mailing list is provided below. No concerns were expressed by these groups or individuals as a result of this consultation. Therefore, there are no known potentially adverse impacts to places of traditional cultural and religious importance to Native Americans as a result of the March 2012 oil and gas lease sale.

Paleontological Resources

The act of leasing does not permit any ground surface disturbing activities; as a result, there will no impacts to paleontological resources from the proposed action.

Several laws, regulations and other authorities require that potential impacts to significant paleontological resources be considered as a result of federally authorized actions. *The Omnibus Public Land Management Act, Paleontological Resources Preservation Subtitle (123 Stat. 1172, 16 U.S.C. 470aaa)* provides specific direction to manage and protect paleontological resources on Federal lands. When project level proposals are submitted for all of the proposed lease parcels, a detailed geological records assessment in order to determine the potential for the occurrence of significant paleontological deposits will be required. Paleontological field assessments of the proposed project area will also be required for those areas with a moderate to high potential for the occurrence of paleontological resources. Project monitoring may also be required for projects proposed for those areas where field survey has indicated that significant subsurface paleontological resources are likely to occur. If significant paleontological remains are discovered during the course of field surveys or project construction, all work will be halted until plans for avoidance or mitigation can be addressed.

Livestock Grazing

There are no federal grazing authorizations within the proposed action.

Lands

Leasing BLM lands for oil/gas exploration and production does not typically impact land uses in this area, because the chances of a successful new find are so slim. However, leasing can sometimes cause conflicts with other surface uses that may be taking place on the lands. This is especially possible if the leased lands are split estate, where the surface estate is privately owned and the mineral estate is federally owned and under the jurisdiction of BLM. Surface owners are often not aware of the Federal ownership of the mineral estate, or are not aware of the implications of the Federal ownership.

The surface owners will be notified that the Federal mineral estate underneath their surface is proposed for oil and gas competitive leasing.

Although there may be local or state laws that require the lease holder (lessee) to compensate the surface owners for any crop loss or damage caused by the development of leased lands; the only compensation provided by federal law on these split estate lands is the value of loss of crops and tangible improvements that are related to stock-raising; such as corn, hay, barn and fences for livestock. Crops include those for feeding domestic animals such as grasses, hay, and corn, but not plants unrelated to stock-raising. Tangible improvements include those relating to domestic, agriculture, and stock-raising uses, such as barns, fences, ponds or other works to improve the utilization of water, but not those associated with nonagricultural development.

Along with the ownership of the minerals the Federal government retains the right to use any part of the surface for exploration or development. These "surface entry rights" can cause distress for private surface owners who do not wish to see new roads and well pads on their land. Adjacent private lands can also be impacted due to leasing, in that new road access to the leased areas is sometimes necessary. Although the responsibility for obtaining access to leased areas is the lessee's and not BLM's, leasing can sometimes cause an indirect impact to adjacent lands due to the need for road access.

Any surface disturbing activity requires BLM approval. For those parcels that are split estate (private surface overlying Federal minerals), the BLM requires the lessee/operator to make a good faith effort to obtain an agreement with the private surface owner prior to access on the leased land issued through competitive bid.

Where the lessee/operator is unable to reach an agreement with the private surface owner, the lessee/operator can file a surface owner protection bond. This bond should be in an amount sufficient to protect against damages to the surface as allowed in the statute that reserved the mineral rights to the Federal government. However, the minimum amount of the surface owner protection bond is $1,000.00. More information regarding the rights and responsibilities of the landowner, the BLM, and the mineral lessee is covered in a pamphlet available on the internet, and in selected local BLM Field Offices.[5]

Oil and Gas and Other Mineral Exploration and Development

This alternative will have a beneficial effect on mineral exploration and development, since the land will be offered for competitive auction. The practical utilization of the lands will have a positive local effect in the generation of long term jobs and revenues to the State and county. The royalties and rentals from

[5] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/split_estate.html

competitive auctions are also a dependable source of long term income for the Federal government. The impacts from this particular auction may be small, including an unknown (but probably relatively small) amount of new reserves, due to the small amount of acreage offered. However, the positive action of the auction would provide the industry with increased opportunity for exploration, potentially resulting in increased stability and profitability of domestic companies.

In most instances, application of the CSU – Protected Species and CSU – Sensitive Species stipulations would not prevent surface occupancy for the entire lease. That is, an alternative site or other mitigation or compensation measure would probably be available that would still allow the lessee to drill and develop the lease.

Farmland

Based on the RFD scenario, development subsequent to leasing the proposed parcels may result in 1.0 acre of disturbance for one well. As described in Chapter 3, soils considered Prime farmland, if irrigated occur on parcels 1 and 2. Subsequent to leasing, any development that occurs on these parcels would result in the direct loss of soils classified as Prime farmland, if irrigated.

CUMULATIVE IMPACTS

Proposed Action Alternative – Cumulative Impacts

In the Caliente Resource Management Plan and EIS, published December 1996, BLM analyzed the overall effects of oil and gas activities in the area. The analyses and conclusions contained in those documents are still valid and, to date, impacts from oil and gas leasing and development are still significantly under the level of cumulative impacts that were projected/analyzed in those documents. See Table 2 - Oil and Gas Surface Disturbance Projected in Existing Caliente RMP/EIS, below.

TABLE 2 –Oil and Gas Surface Disturbance Projected in Existing Caliente RMP/EIS (acres)
(Valley Planning area, 10 years)

	Projected	Actual
Total Fed Wells Drilled (All leases, new + existing)	1459-2200	1564
Habitat Disturbance	147 acres/year	48
Total Habitat Disturbance Projected on New Lease Sales EAs Past 10 Years	>500	25.5

The existing RMP/EIS projected and analyzed the impacts from permanent new disturbance in habitat of up to 147 acres per year. In fact, between July 99 and October 2009, a total of only 480 acres was disturbed throughout the entire Bakersfield Field Office area, a larger area than considered in this sale. This amounts to only 48 acres per year, not the 147 acres that was analyzed. There have not been and are not expected to be any additional impacts in the parcels covered in this EA that would change those conclusions. In addition, as mentioned previously, there have been 20 lease sales in this area in the past 10 years (since 10-1-2001), each of which projected various numbers of wells, both exploratory and development, as well as other types of activities that would cause surface disturbance. However, out of 239 leases that have been issued in this area since October 1, 2001, only 12 leases have seen any drilling at all. Only 30 acres of temporary or permanent disturbance has occurred, which means nearly of all the

projected disturbance on those leases never occurred. In addition, as shown elsewhere in this document, nearly all of the other impacts (air, soil, etc.) also never occurred.

Cumulative Impacts to Minerals

Only a small portion of the land in the project area is managed by the BLM (less than 10%). Nearly all of the minerals that are managed by the BLM that is most prospective for oil and gas (i.e., within the boundaries of existing producing areas) is already leased. In addition, all (or virtually all) of the private minerals within the project area where there is likelihood for development is already leased. There are many opportunities for development both on private and public minerals and more than 11,000 wells have been drilled in western Kern County in the past 5 years alone. Since the Caliente RMP/EIS was completed, permitting requirements have become increasingly stringent, especially regarding minimizing impacts to air quality and endangered species habitat. This has resulted in an unknown (probably small to moderate) number of wells not being drilled. However, the significant rise in oil prices since then has resulted in an increase in the number of wells drilled. In any event, the extremely small amount of development projected for this sale, although positive for oil and gas development, is considered to be negligible from a cumulative impact viewpoint.

For a more complete discussion of the types of activities associated with exploration, drilling, and production, in addition to the environmental consequences to Minerals and the cumulative impacts on Minerals see the Caliente RMP/EIS, Ch. 5 Pg. 33 to which this document is tiered. These discussions include Reasonable Foreseeable Development scenarios (RFDs) and impacts, both general and cumulative. Many of these activities are also described in Appendix C.

Cumulative Impacts to Air Quality

The cumulative impacts area of analysis is the EPA Region IX. This area also includes the *San Joaquin Valley, CA – Extreme 8-hr Ozone Nonattainment Area*, the *San Joaquin Valley, CA – PM2.5 Nonattainment* Area, and the *San Joaquin Valley, CA PM10 Maintenance Area*. Based on the RFD, the expected emissions from drilling one well on one acre would be minimal and low in relation to the overall activity in the region. The expected emissions are not anticipated to result in a substantial increase in emissions, and emission levels are within the attainment demonstrations included in the SIP.The air quality impacts are not anticipated to result in, or contribute to, exceedances of the NAAQS. Furthermore, existing and new stationary and mobile source emissions are permitted by the San Joaquin Valley APCD and California Air Resources Board, respectively. Small scale projects that have minimal impacts that are of short-duration would not likely contribute significantly to cumulative impacts (EPA 315-R-99-002; May 1999).

Cumulative Impacts to Climate Change

For this analysis, the RFD predicts that one well will be drilled as a result of the proposed action. There is no generally accepted guidance for determining significance of project specific GHG impacts (SJVAPCD, 2009a). Emissions from the construction of one well would be expected to be lower than the national average because of vapor recovery systems and other pollution controls (Best Performance Standards) mandated by the San Joaquin Valley Air Pollution Control District. Values for GHG emissions are expected to follow a similar pattern. Thus, direct GHG emissions from the proposed action would be undetectable on a nationwide basis and would be expected to have a very minor influence on global climate change. This is consistent with the SJVAPCD conclusion that existing science is inadequate to support quantification of impacts that project level GHG emissions would have on global climate change (SJVAPCD 2009b). The U.S. Global Change Research Program recognizes that further

work is needed on how to quantify cumulative uncertainties across spatial scales, and the uncertainties associated with complex intertwined natural and social systems (Karl *et al*. 2009).

However, the effects of project specific GHG emissions are cumulative, and without mitigation their incremental contribution to global climatic change could be considered cumulatively considerable (SJVAPCD 2009a). The SJVAPCD's best approach in addressing cumulative impacts would be to require all projects to reduce their GHG emissions, through project design elements or mitigation. Since GHG emissions from well drilling and/or completion are not presently quantifiable, these impacts are not anticipated to cumulatively influence climate on a global scale.

Cumulative Impacts to Soil Resources

There are a number of past and existing disturbances including roadways on the parcels proposed for leasing. The direct and indirect effects of the proposed action are limited to the localized region of the reasonably foreseeable development scenario, which equates to approximately one acre of soil that may be temporarily and/or permanently impacted. Since portions of the parcels are currently disturbed and/or degraded by past oilfield development, the project effects on soils are not anticipated to cumulatively impact soils in the vicinity or region.

In early 2010, a former Clean Water Act exemption under the 2005 Energy Policy Act for oil field construction expired; therefore, *all* oil and gas construction projects measuring 1.0 acres in size or greater would be subject to the State Water Quality Control Board (SWQCB) General Permit requirements, in compliance with state and federal Clean Water Acts. Compliance with Clean Water Acts and SWQCB permit requirements would be expected to reduce impacts to soil resources on a landscape level.

Cumulative Impacts to Water Resources

The direct and indirect effects of the proposed action are limited to the localized area of the reasonably foreseeable development scenario (one well approximately 1.0 acre in size). Since no direct impacts to surface water or groundwater are anticipated, indirect impacts to water quality would be avoided by implementing standard operating procedures (SOPs) for oil field practices and the BLM best management practices (BMPs). Furthermore, any oil field construction project 1.0 acre or greater in size would be subject to the California Regional Water Quality Control Board General Permit requirements; therefore, development associated with the RFD for the proposed action would be subject to compliance with these permit requirements. Since no direct or indirect effects are anticipated from the proposed action, the project will not result in cumulative impacts to water resources.

Cumulative Impacts to Biological Resources

Loss, degradation and fragmentation of habitat have resulted in population declines for many San Joaquin Valley species. Development for agriculture, energy production, and urban areas, and recreational activities such as off-highway vehicles, has resulted in loss of habitat. Development at key locations, roads, trails and water canals have fragmented habitat. Incompatible land uses, such as trash dumping and heavy grazing has degraded habitat. Invasion of non-native weeds, and increases in predators, such as ravens and red fox, also contribute to habitat degradation. Large landscape fires have replaced mature shrub communities with non-native grasslands that can persist for one or more decades.

The conservation and recovery strategy for San Joaquin Valley species is a system of reserves and corridors. In the Caliente RMP, BLM committed to managing all BLM lands within reserves and

corridors as part of the conservation and recovery system. The Bakersfield RMP is likely to do the same. These lands are managed to maintain 90% of the habitat in reserves and 75% of the habitat in the corridors. Restoration is undertaken on lands that do not meet the habitat maintenance goal before new development is authorized.

Beginning in about the early 1990's, compensation has been required for most new development. For every acre permanently disturbed, 3 acres must be set aside, and for every acre temporarily disturbed 1.1 acres must be set aside. In addition, if the land being disturbed is already part of the conservation and recovery system, an additional acre must be set-aside to replace the conserved acre. This increases the ratio to 4:1 or 2.1 to 1 for lands that are already part of the reserve and corridor system. This compensation requirement helped to establish large mitigation banks, such as Coles Levee, Semitropic Ridge, and Kern Water Bank. Numerous other entities have also secured or pledged lands in various locations to the reserve and corridor system. Energy companies and conservation organizations have added reserve and corridor lands to the system in such areas as Lokern, Kettleman Hills, Buena Vista Valley and Buena Vista Hills. Future development is likely to require compensation and more lands are likely to be added to the reserve and corridor system.

Habitat loss, fragmentation and degradation are likely to continue as a threat to species conservation and recovery in the San Joaquin Valley. However, the requirement for compensation and replacement acres will help secure lands for the reserve and corridor system. As habitat is incrementally disturbed, habitat will also be incrementally conserved, helping to prevent significant habitat losses. This will allow the conservation and recovery strategy for the San Joaquin Valley species to be implemented and offset impacts from development.

To determine if the effects of the proposed action, when taken together with the effects of past, present and reasonably foreseeable habitat disturbance, would result in significant impacts to biological resources, the following thresholds were used:

1. Effects to San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, Tipton kangaroo rat, and San Joaquin antelope squirrel would be significant if the amount of habitat disturbance exceeds the 90% and 75% habitat conservation objectives of the San Joaquin Valley reserve and corridor strategy.
2. Within reserve areas, impacts to listed species conservation and recovery would be significant if habitat disturbance exceeds 10% of a reserve area. Lands within reserve areas that were identified as agricultural or non-habitat in the 1990 baseline studies would be excluded from the disturbance calculation.
3. Within corridors, impacts to listed species conservation and recovery would be significant if habitat disturbance decreases the corridor width to less than one mile at any point.
4. If habitat disturbance within a one mile polygon around the lease parcel exceeds 25 percent, a lease notice would be applied to conduct lease activities on previously disturbed land and/or habitat restoration of equal or greater amount would be required elsewhere in the corridor. This would result in no additional impacts to the function of the corridor and would thus result in impacts that would be below the significance threshold.

Aerial photography for each parcel was reviewed to determine the existing level of disturbance. An assessment was made to determine if any of the thresholds would be exceeded with the additional acre loss from leasing the parcels, and any reasonably foreseeable unrelated project. The parcels were also evaluated to determine if a lease notice to avoid new habitat restoration or require habitat restoration within the corridor would be applied to keep impacts below a significance threshold.

All parcels are located within the corridor areas (green zone). All parcels have private surface overlaying Federal minerals. An analysis of the cumulative effects of one well (one acre of habitat impact), combined with past, present, and future actions that are recently certain to occur, are not expected to exceed the threshold criteria of 25 percent disturbance on the parcels or the one mile buffer within the habitat corridor surrounding each of these parcels nor would the construction of one well pad decrease the corridor width to less than one mile wide. Thus, there are no significant cumulative impacts to the San Joaquin Valley upland species conservation and recovery strategy.

Cumulative Impacts to Biological Resources from Climate Change

Climate models predict that, as a result of global warming, Southern California will tend to be hotter and drier in the future, with an increase in the frequency and duration of drought (Christensen et al. 2007). Drier conditions for the San Joaquin Valley means that overall, there will be less vegetative growth. A shift in vegetation zones is also expected. Oak and Juniper woodlands will give way to scrublands, and scrublands to grasslands. Future grasslands will have more areas of bare soil and vegetation will be sparser. Woodlands may disappear from some portions of the San Joaquin Valley and become restricted to the higher elevations of the San Joaquin Valley and surrounding foothills. Plant communities and animal guilds may migrate upward or northward in elevation, as the general area becomes drier. With a slight drying, the wild oat grasslands in the northern part of the San Joaquin Valley would be expected to shift to brome-dominated grasslands. As precipitation levels and recharge decline, some springs will dry up, while others will diminish in flow. This may have consequences for those plants and animals depending on these water sources.

The result of this change in the southern San Joaquin Valley may result in conditions that are similar to those currently experienced during a series of drought years when very little rain falls in the region. During current drought conditions, herbaceous vegetation cover and production decreases, while the amount of bare ground increases. In some locations, individual plants and stands of perennial shrubs become dormant or even die due to increased stress.

A more arid environment would have varied effects on the San Joaquin Valley suite of species. Currently, during a series of extremely low rainfall years when annual plant production is reduced or absent and food resources become scarce, populations of blunt-nosed leopard lizards and small mammals, including giant kangaroo rat, Tipton kangaroo rat and San Joaquin antelope squirrel, tend to decline (Germano and Williams 2005, Rathbun 1998, Williams et. al. 1993). The decline continues until more widespread germination of annual plants resumes (Germano and Williams 2005, Rathbun 1998, Williams et. al. 1993). In the predicted more arid climate, during years with a low to average rainfall, herbaceous plant production would be reduced, and grass cover would be sparser and less persistent than what currently occurs during average rainfall years. Annual vegetation that is lower and sparser may partially benefit the small mammals and lizards of the San Joaquin Valley since persistent non-native plant cover reduces habitat suitability for these species (Germano et. al. 2001). Population levels of these species will reflect the benefits of a more open structure versus the liabilities of decreased food resources.

Since San Joaquin Valley animal species have evolved under desert conditions they may be better able to persist in a more arid climate than other species. During drought conditions, populations decline but do not completely disappear. Populations recover once rainfall sufficient for germination occurs. So long as future drought periods do not exceed the time period that source animals can persist, the San Joaquin Valley suite of species are expected to persist. A more arid climate may also promote a more open and sparser vegetation pattern that these species favor. The non-native grasses and filaree that have invaded the region over the past two hundred years may become less persistent and dense, favoring a habitat structure the San Joaquin Valley species prefer.

The indirect impacts from leasing these parcels could result in one acre of habitat loss. Since the predicted changes discussed above would generally maintain suitable habitat for the natural communities of the southern San Joaquin Valley, adding the loss of one acre of habitat to the effects of climate change would have a negligible cumulative effect on the biological resources of the region.

Cumulative Impacts to Cultural Resources

There would be no direct or indirect effects to cultural resources as a result of the proposed action, therefore there will be no cumulative effects.

Cumulative Impacts to Native American Values

There would be no direct or indirect effects to Native American Values as a result of the proposed action; therefore there will be no cumulative effects.

Cumulative Impacts to Paleontological Resources

There would be no direct or indirect effects to paleontological resources as a result of the proposed action, therefore there will be no cumulative effects.

No Action Alternative – Direct, Indirect and Cumulative Impacts

Should the No Action alternative be selected, these lands would not be leased for oil and gas at the present time. They would remain available for competitive leasing in the future, should circumstances change to make that option worth re-considering. If these parcels are not leased, then foreseeable future resources and uses, as well as their current rates of change, would remain as described in the Affected Environment. Cumulative impacts of management activities with the no action alternative on public lands would remain as they exist presently and as described in the Affected Environment section of this document.

Socio-Economic – No additional impacts would occur.

Visual Resources – No additional impacts would occur.

Recreation – No additional impacts would occur.

Air, Soil, and Water – There would be no additional impacts to air, soil, and water since these parcels would not be offered for lease. Under the no action alternative, the San Joaquin Valley Air Basin would continue to be in nonattainment of federal and state air quality standards for ozone and PM2.5.

Biological Resources – No additional impacts would occur.

Cultural Resources – No additional impacts would occur.

Livestock Grazing – No impacts would occur.

Lands and Farmland – No additional impacts would occur.

Oil and Gas – The no action alternative would represent a fundamental change in the decisions of the Caliente RMP and would not comply with Mineral Leasing Act of 1920 and subsequent amendments, The Federal Oil and Gas Royalty Management Act of 1976 (Public Law 94-579), the Energy Policy Act of August 5, 2005, and current regulations and policies to manage lands for multiple uses. Failure to make these lands available for leasing and subsequent development would also result in the loss of potential additional reserves of oil and/or gas. The amount and value of lost reserves would be difficult to predict at this time without additional data.

Chapter 5. Consultation and Public Involvement

PERSONS, GROUPS, AND AGENCIES CONSULTED

List groups, Tribes, individuals, agencies contacted

Name	Title	Organization
Mr. Ryan Garfield	Chairperson	Tule River Reservation
Ms. Kerri Vera	Environmental Program Lead	Tule River Reservation
Mr. Ruben Barrios, Sr.	Chairperson	Santa Rosa Rancheria
Mr. Hector Franco	Cultural Resource Specialist	Santa Rosa Rancheria
Ms. Gloria Morgan		Tejon Indian Tribe

SUMMARY OF PUBLIC PARTICIPATION

The scoping process took place on September 8, 2011. A brief review of the parcels and discussion of the areas were conducted to identify any concerns relating to plants or animal species. This EA will be published to the BLM Bakersfield website for a period of 30 days to allow the public to comment within the 30 day period. Also, copies of the EA are mailed out to the Counties where the parcels are located, environmental groups, the public and landowners for review and comment within the 30 day public comment period.

LIST OF PREPARERS

ID Team Member	Title	Organization
Lisa Ashley	Natural Resource Specialist	BLM
Nora DeDios	Realty Specialist, Project Lead	BLM
Peter De Witt	Outdoor Recreation Planner	BLM
Karen Doran	Rangeland Management Specialist	BLM
Amy Girado	Archaeologist	BLM
Denis Kearns	Botanist	BLM
Amy Kuritsubo	Wildlife Biologist	BLM
Jeff Prude	Petroleum Engineer	BLM
Larry Saslaw	Wildlife Biologist	BLM
Tamara Whitley	Archaeologist	BLM

Chapter 6. References

References for References for Air and Atmospheric Values, Soil and Water Resources

http://www.epa.gov/region09/air/sips/index.html

http://www.arb.ca.gov/desig/desig.htm (accessed 10/3/2011)

http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2009-03-13.pdf

http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

http://www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf.

http://coolweather.net/staterainfall/california.htm

http://www.consrv.ca.gov/DOG

http://www.epa.gov/air/caa/peg/

http://www.epa.gov/air/oaqps/greenbk.html

http://www.epa.gov/climatechange/effects/forests.html

http://www.epa.gov/climatechange/emissions/

http://www.epa.gov/region09/air/sips/index.html

http://www.ipcc.ch/http://www.global change.gov/

http://www. arb.ca.gov/cc/oil-gas/oil-gas.htm

http://soildatamart.nrcs.usda/gov (accessed 9/29/2011)

http://www.us-cap.org/

http://www.valleyair.org/

http://websoilsurvey.nrcs.usda.gov/app/ (accessed 9/29/2011)

http://www.wrcc.dri.edu/monitor/cal-mon/frames_version.htmlIPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K. and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

California Environmental Protection Agency, Air Resources Board. Staff Report.Analysis of San Joaquin Valley 2007 PM10 Maintenance Plan. Release date: October 12, 2007.

CARB, May 23, 2007- Cal/EPA Headquarters. California Global Warming Solutions Act of 2006, Greenhouse Gas Inventory and Mandatory Reporting. Implementation of AB 32 Requirements. Microsoft PowerPoint Presentation.

Chang, K. K. 1988. United States Department of Agriculture, Soil Conservation Service. Soil Survey of Kern County, California, Northwestern Part.

California Air Resources Board. 2007. Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution. [Online fact sheet] California Air Resources Board, Sacramento, 7 pp. http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf.

California Climate Action Team. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. California Environmental Protection Agency, Sacramento, 107 pp.

Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr and P. Whetton, 2007. Regional Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Karl, T. P., J.M. Melillo, and T.C. Peterson, (eds.). Global Climate Change Impacts in the United States. Cambridge University Press, 2009.

Luers, A. et al. 2006. Our Changing Climate: Assessing the Risks to California. California Climate Change Center, a Summary Report.

McGinnis, S. 2009. Climate Change, What We Know And What We Can Do In Our NEPA Analyses, Microsoft PowerPoint Presentation.

Ramanathan V. and G. Carmichael, Global and Regional Climate Changes Due to Black Carbon, *Nature Geoscience* 1:221 (2008).

SJVAPCD a. Draft Staff Report –Climate Change Action Plan: Addressing GHG under CEQA. June 30, 2009.

SJVAPCD b. CEQA GHG Guidance, June 30, 2009. Microsoft PowerPoint Presentation.
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ accessed [5/7/09].

United States Department of Agriculture, Natural Resources Conservation Service. 2009. Soil survey of Kern County, California, southwest part. Accessible online at: http://soils.usda.gov/survey/printed_surveys/.

U.S. Global Change Research Program. June 2009. Global Climate Change Impacts in the United States ("GCRP Report"). http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts.

Zahniser, Angela (date unknown), Characterization of Greenhouse Gas Emissions involved in Oil and Gas Exploration and Production Operations, Review for the California Air Resources Board.

References for Biological Resources

California Natural Diversity Database, Version 3.1.0. October 2010. California Department of Fish and Game. Sacramento, California.

California Native Plant Society. 2001. Inventory of Rare and Endangered Plants of California (6th ed). Rare Plant Scientific Advisory Committee, David P. Tibor, Convening Editor. California Native Plant Society. Sacramento, CA. x + 388 pp.

California Native Plant Society Online Inventory of Rare and Endangered Plants, Version 7-07b, 4-12-07. California Native Plant Society. http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi
California Wildlife Habitat Relationships. 2005. GIS Species Range Maps.
http://www.dfg.ca.gov/biogeodata/cwhr/

Cayan, D., A.L. Luers, M. Hanemann, G. Franco, and B. Croes. 2006. Scenarios of Climate Change in California: An Overview. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-186-SF.

http://www.energy.ca.gov/2005publications/CEC-500-2005-186/CEC-500-2005-186-SF.PDF
Christensen, J.H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr and P. Whetton, 2007. Regional Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
Consortium of California Herbaria 2010. *Data provided by the participants of the Consortium of California Herbaria (*http://ucjeps.berkeley.edu/consortium/).

Cypher, B. L., G. D. Warrick, M.R.M. Otten, T.P. O'Farrell, W.H. Berry, C.E. Harris, T.T. Kato, P.M. McCue, J.H. Scrivner, B.W. Zoellick. 2000. Population dynamics of San Joaquin kit fox at the Naval Petroleum reserves in California. Wildlife Monographs 145, 1-43.

Germano, D. J. and D. F. Williams. 2005. Population ecology of blunt-nosed leopard lizards in high elevation foothill habitat. Journal of Herpetology, 39(1):1-18.

Germano, D.J., G.B. Rathbun and L.R. Saslaw. 2001. Managing exotic grasses and conserving declining species. Wildlife Society Bulletin, 29(2):551-559.

Hall, E.R. and K.R. Kelson. 1959. The mammals of North America, volumes I and II. The Ronald Press Company, New York. 1083 pp.

Hickman, J.C., ed. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley and Los Angeles. xvii + 1400 pp.

Rathbun, G. B. 1998. Rodent trapping summary: Carrizo Plain Natural Area. Prepared for California Department of Fish and Game. Unpubl. Annual Rep.

Spiegel, L. K., 1996. Studies of San Joaquin kit fox in undeveloped and oil-developed areas. California Energy Commission, Sacramento, California. 131 pp.

Taylor, D.W., and W.B. Davilla. 1986. Status survey of three plants endemic to the San JoaquinValley. Prepared for California Department of Fish and Game. Sacramento, California.

U.S. Fish and Wildlife Service. 1998. Recovery Plan for Upland Species of the San JoaquinValley,California. Region 1, Portland, OR. 319 pp.

U.S. Fish and Wildlife Service. 1996. Recovery Plan for the California Condor. Region 1, Portland, OR. 62pp.

Verner, J. and A. Boss, technical coordinators. 1980. California Wildlife and their Habitats: Western Sierra Nevada. Gen. Tech. Rep. PSW-37. Pacific Southwest Forest and Range Exp. Station, USDA Forest Service, Berkeley. 439 pp.

Williams, D. F. 2001. Checklist of California Mammals. California State University, Stanislaus. Turlock, CA. http://arnica.csustan.edu/esrpp/calilist.htm

Williams, D. F., D. J. Germano, and W. Tordoff III. 1993. Population studies of endangered kangaroo rats and blunt-nosed leopard lizards in the Carrizo Plain Natural Area, California. California Department of Fish and Game, Nongame Bird and Mammal Sec., Rep. 93-01:1-114.

Zeiner, D. C., Laudenslayer, W. F., Mayer, K. E., White, M, editors. 1990. California's Wildlife, Volume I, Amphibian and Reptiles. California Department of Fish and Game. Sacramento, CA. 272 pp.

Zeiner, D. C., Laudenslayer, W. F., Mayer, K. E., White, M, editors. 1990. California's Wildlife, Volume II, Birds. California Department of Fish and Game. Sacramento, CA. 731 pp.

Zeiner, D. C., Laudenslayer, W. F., Mayer, K. E., White, M, editors. 1990. California's Wildlife, Volume III, Mammals. California Department of Fish and Game. Sacramento, CA. 407 pp.

References for Cultural Resources

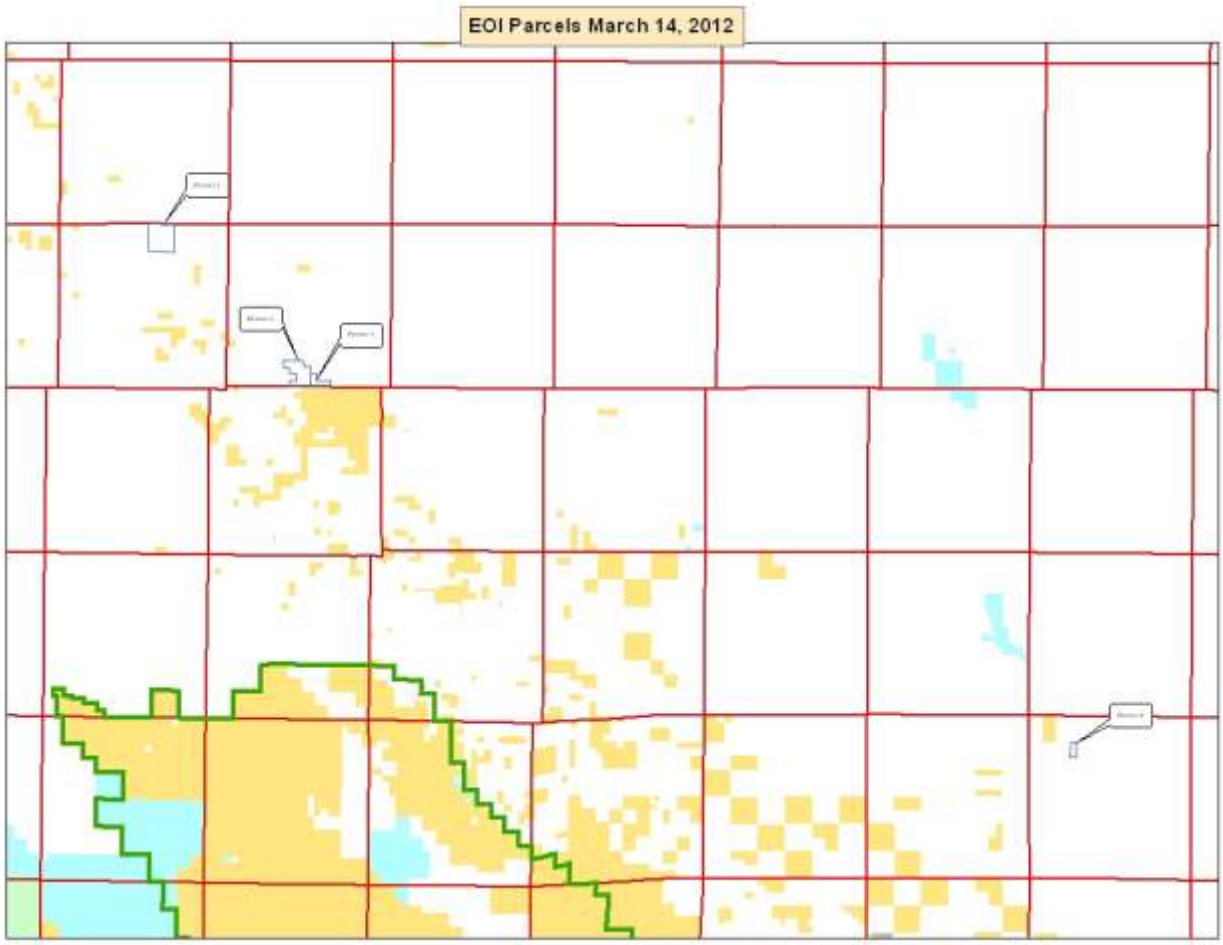
Latta, Frank F. 1977. Handbook of Yokuts Indians. Santa Cruz: Bear State Books.
Rintoul, William. 1976. Spudding In. California Historical Society. Fresno, California

Reference for Floodplains

Department of Agriculture
Natural Resource Conservation
5000 California Ave., Suite 100
Bakersfield, CA 93309

APPENDIX A - Description of Lease Sale Parcels

Following is a map showing the general location of the parcels analyzed in this EA.
You must zoom in to view the parcels



The following public domain lands all located within the Bakersfield Field Office administered lands, are subject to filings in the manner specified in the applicable portions of the regulations at 43 CFR, Subpart 3120. These parcel numbers will be different from those on the actual Lease Sale Notice, and officially parcelized for the day of the auction.

Table 1. March 14, 2012 Oil and Gas Competitive Lease Auction Parcels

NO.	LOCATION	COUNTY	ACRES	TYPE
1	T. 28 S., R. 19 E., MD Mer., Sec. 3, All;	Kern	594.03	Split Estate Land Subject to Special Stipulations
2	T. 28 S., R. 20 E., MD Mer., Sec. 33, Lots 2, 3, 4,6-10, 14, 15, 16;	Kern	428.87	Split Estate Land Subject to Special Stipulations
3	T. 28 S., R. 20 E., MD Mer., Sec. 34, Lots 3-6;	Kern	156.25	Split Estate Land Subject to Special Stipulations
4	T. 31 S., R. 25 E., MD Mer., Sec. 8, W½NE¼;	Kern	80.00	Split Estate Land Subject to Special Stipulations

APPENDIX B - Special Lease Stipulations

Stipulation No. 1 - Controlled Surface Use - Protected Species: All or a portion of this lease is within the range of one or more plant or animal species that are either listed as threatened or endangered, or are proposed for such listing by the U.S. Fish and Wildlife Service (USFWS).

The lessee is notified that time frames for processing applications may be delayed beyond established standards to allow for species surveys, and consultation or conferencing with the USFWS. Notice is also given that surface-disturbing activities may be moved or modified, and that some activities may be prohibited during seasonal time periods. Surface-disturbing activities will be prohibited on the lease only where:

a. The proposed action is likely to jeopardize the continued existence of a listed or proposed species, or
b. The proposed action is inconsistent with the recovery needs of a listed species as identified in an approved USFWS Recovery Plan.

Prior to the authorization of any surface-disturbing activities, a preliminary environmental review will be conducted to identify the potential presence of habitat for these species. Authorizations may be delayed until completion of the necessary surveys during the appropriate time period for these species. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year.

The Bureau of Land Management (BLM) may need to initiate consultation or conference with the USFWS if the site inspection concludes that a listed or proposed species may be affected by the proposed activity. The lessee should be aware that the USFWS has up to 135 days to render their biological opinion, and that there are provisions for an additional 60-day extension. Offsite habitat protection or enhancement for wildlife or vegetation (compensation) may be required by the USFWS when habitat is disturbed. The consultation may also result in some restrictions to the lessee's plan of development, including movement or modification of activities, and seasonal restrictions. Surface-disturbing activities will be prohibited on the lease if the consultation or conference concludes that either of the conditions identified in a or b above exist.

Stipulation No. 1 - Controlled Surface Use - Sensitive Species: All or a portion of this lease is within the range of one or more plant or animal species that are either Federal candidates for listing as threatened or endangered (Federal Candidate), or are listed by the State of California as threatened or endangered (State Listed), or are designated by the Bureau of Land Management (BLM) as Sensitive (Bureau Sensitive).

The lessee is notified that time frames for processing applications may be delayed beyond established standards to allow for species surveys and coordination with the USFWS and California Department of Fish and Game. Notice is also given that surface-disturbing activities may be relocated beyond the standard 200 meters but not more than 1/4 mile and that surface disturbing activities may be prohibited during seasonal time periods.
Prior to the authorization of any surface-disturbing activities, a preliminary environmental review will be conducted to identify the potential presence of habitat for these species. Authorizations may be delayed until completion of the necessary surveys during the appropriate time period for these species. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year. The BLM may need to coordinate with the USFWS or the California Department of Fish and Game if the site inspection concludes that a Federal Candidate, State Listed, or Bureau Sensitive species may be affected by the proposed activity. Coordination may delay application processing beyond established time frames.

To prevent or reduce disturbance to Federal Candidate, State Listed, or Bureau Sensitive species, surface operations may be moved up to 1/4 mile and surface-disturbing activities may be prohibited during seasonal time periods.

Table Biology 1. Federal and State Listed, and BLM Sensitive animal species with potential to occur on the lease parcels.

Species	Blunt-nosed leopard lizard	Giant kangaroo rat	San Joaquin kit fox	San Joaquin antelope squirrel	Burrowing owl	Short-nosed kangaroo rat	San Joaquin pocket mouse	Tulare grasshopper mouse	Pallid bat
Status	**FE, SE**	**FE, SE**	**FE, ST**	**ST**	**BLM Sensitive**	**BLM Sensitive**	**BLM Sensitive**	**BLM Sensitive**	**BLM Sensitive**
Temblors Unit	X	X	X	X	X	X	X	X	X
Buena Vista Unit	X	X	X	X	X	X	X	X	X

Status

FE – Federally Endangered
FT – Federally Threatened
SE – State Endangered
ST – State Threatened
BLM Sensitive – BLM California Sensitive Species

Table Biology 2. Federally Listed & BLM sensitive plants with potential to occur on the December 2011 lease parcels.

Species	Status	Temblors Unit	Buena Vista Unit
San Joaquin woolythreads (*Monolopia congdonii*)	FE	X	
Hoover's woollystar (*Eriastrum hooveri*)	FD	X	X
heartscale (*Atriplex cordulata*)	BLM SS		X
Lost Hills crownscale (*Atriplex vallicola*)	BLM SS		X
Temblor buckwheat (*Eriogonum temblorense*),	BLM SS	X	
recurved larkspur (*Delphinium recurvatum*)	BLM SS	X	
Tejon poppy (*Eschscholzia lemmonii* ssp. *kernensis*)	BLM SS		X
diamond-petaled California poppy (*Eschscholtzia rhombifolia*)	BLM SS	X	
oil neststraw (*Stylocline citroleum)*	BLM SS		X
pale yellow layia (*Layia heterotricha*)	BLM SS	X	

Status

FE – Federally Endangered
FT – Federally Threatened
FD – Federally Delisted
BLM SS – BLM California Sensitive Species

APPENDIX C – Oil & Gas Management Guidelines

Oil and Gas Leasing Availability Categories

The Caliente Resource Management Plan describes the various categories of land availability for leasing for oil and gas. A determination has been made that the lands covered by this EA are open to leasing for oil and gas. In addition, the plan identifies the appropriate stipulations to be associated with each new lease.

Public lands that are closed to leasing separate into two groups. Tracts that have been closed by previous legislation or secretarial policy form one group of lands and are known as non-discretionary closures. The second group of closed lands, consisting of those that would possibly be proposed for closure under this plan, is called proposed discretionary closures.

Lands open to oil and gas leasing separate into the following groups: open to leasing under standard lease terms and conditions; open to leasing under a no surface use stipulation; and open to leasing under a controlled surface use stipulation. The standard oil and gas lease form includes those preprinted lease terms and conditions that apply to all leases. Other stipulations developed in this plan are applied in lease areas with special resource concerns, and supersede any inconsistent provisions of the standard lease form. The special stipulations proposed in this plan address Controlled surface use for areas with resource protection needs slightly different from the standard lease stipulation. The Controlled Surface Use (LSU)stipulation provides additional protection for Federally Proposed and Listed Species; Proposed and Designated Critical Threatened and Endangered Species Habitat; and Federal Candidate, State Listed and Bureau Sensitive Species. Three additional special stipulations were contained in the Caliente RMP that are not applicable to any of the land in the subject parcels. Those special stipulations are: No surface use for areas where very unique resources exist, LSU – Department of Defense lands, and LSU – Coast (for management of Coast Area ACEC's/SMA's).

Lands Open to Oil and Gas Leasing

All public land and federally reserved mineral estate within the area covered under this EA are open for oil and gas leasing activities. The process of nominating a federal parcel for this lease sale was initiated when a letter of interest in oil and gas leasing was submitted to the Sacramento Office of the Bureau of Land Management. The RMP was used to determine the applicability of lease stipulations attached to the parcels in this sale. There are three categories of lease stipulations, described in detail below, and they are:

--Offer for lease with a Standard Lease stipulation
-Offer for lease with a No Surface Use stipulation
--Offer for lease with a Controlled Surface Use stipulation

All new leases covered by this EA would be offered with Controlled Surface Use Stipulation(s) (LSU). If new leases expire or terminate and the lands are re-leased, they will also be leased with Controlled Surface Use Stipulation(s).

Leasing with Standard Lease Stipulation

The Standard Lease stipulation includes the terms and conditions that are the national standards printed on Bureau of Land Management lease forms (Form 3100-11, February 2003).

Under standard terms, a proposed exploration and development operation can be modified by the operator and Bureau to minimize impacts of the project's operation design. Modifications are limited to moving the proposed operation less than 200 meters and delaying the project less than 60 days in one lease year.

No lands covered by this EA are proposed to have this stipulation.

Additional Information

Application. The No Surface Use stipulation is intended for use when adequate protection of surface resources cannot be provided through mitigation, and there are no suitable sites for development anywhere on the entire lease. Mineral development of the lease from an off-site location is recommended.

Review Process. If conditions change so that the NSU stipulation becomes necessary for lands to be leased at a future date, the No Surface Use stipulation would be applied at the time of a lease sale. An exception or modification to the stipulation may be approved if it can be demonstrated that operations can be conducted without causing unacceptable impacts to the critical cultural or natural values or to the other pre-existing use. Any decision to grant an exception or modification would be based on field inspection and inventory and the NEPA review process. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year. The stipulation may be waived if a determination is made by the Bureau that the resource or other use no longer exists on the leased lands.

Although there may be specific discrete areas within the parcels under this EA where No Surface Use is allowed due to pre-existing conditions, there are no leases where the entire surface is precluded from development.

Leasing with the Controlled Surface Use Stipulation

Special stipulations may be proposed for use to protect unique resources or values where it may be necessary to modify surface activities beyond authorities contained under the standard lease terms (43 CFR 3103.1-3). The Controlled Surface Use Stipulation allows BLM, in consultation with the applicant, to extend modification of development proposals beyond the standard 200 meters and 60-day conditions. By reserving the additional leeway in siting facilities, the BLM and applicant can generally use the combination of increased siting and timing flexibility to modify development proposals to entirely avoid or significantly minimize surface-disturbing effects associated with lease development. The Controlled Surface Use stipulation thus allows BLM to offer for lease parcels known to or suspected to contain unique resources or values and resolve any potential conflicts at the time when the lessee is prepared to design development proposals.

This stipulation also advises prospective lessees that they are considering the purchase of a lease in areas known or suspected to contain unique resources or values and advises them of potential constraints and development options available. Historically, the BLM in cooperation with the lessee has been able to find sufficient flexibility in designing lease development proposals, even in the most sensitive of locations, to facilitate development without adversely affecting either the resource values of concern or the oil and gas lease.

Special conditions that may be attached to new leases issued in the area managed by the Bakersfield Field Office are collectively referred to as the Controlled Surface Use stipulation (LSU) and supersede any inconsistent provisions of the standard lease form. The wording of the Controlled Surface Use stipulation has been adjusted to address two differing resource concerns (there were six in the Caliente RMP, but

four are not currently applicable because the resource values or other pertinent criteria do not exist in the subject parcels). The Controlled Surface Use Stipulation would be applied at the lease sale, to parcels located as shown on the RMP map and as described below.

This stipulation has been developed to be utilized over the life of the plan without the need for further plan amendments. The CSU stipulation has been worded to allow for adjusting the geographic locations where they would be applied based on the resource condition at the time of the lease sale offering. The locations identified in this EA address 2007 resource conditions that will be updated and modified on an annual basis. Information on those updates will be available to those interested in potential lease sales.

Controlled Surface Use Stipulations

a. Federally Proposed and Listed Species (CSU - Protected Species)
b. Federal Candidate, State Listed and Bureau Sensitive Species (CSU - Sensitive Species)

The following CSU categories from the Caliente RMP are shown for informational purposes only – there are currently no lands in the parcels covered by this EA area subject to these stipulations. However, if a determination is made in the future that one or more of the following stipulations would be appropriate, then the stipulation(s) would be applied according to the criteria in the Caliente RMP.

c. Proposed Critical Habitat and Designated Critical Habitat (CSU - Critical Habitat) N/A for the parcels in this EA
d. Raptor (CSU - Raptor) N/A for the parcels in this EA
e. Department of Defense lands (CSU – Defense) – N/A for the parcels in this EA
f. Coast Management Area (LSU – Coast, for management of Coast Area ACEC's/SMA's) – N/A for the parcels in this EA

Waivers, Modification, Exceptions and Deferral to Other Plans

The Authorized Officer may grant a waiver, modification, or exception to the Controlled Surface Use stipulation if the factors leading to the stipulation's inclusion in the lease have changed or if new information has been made available. If the protection provided by the stipulation is no longer necessary or can be adequately mitigated and the proposed operation on a lease would not cause unacceptable impacts, a waiver would be evaluated (see 43 CFR 3101.1-4).

The Authorized Officer may also defer the addition of the Controlled Surface Use stipulation referred to under b, c, and d above to requiring compliance with other existing approved plans. Those plans may include Habitat Conservation Plans, Programmatic Consultations, Conservation Agreements or others that provide for adequate protection and conservation of resources and compliance with all Federal and State laws.
As an example, once completed, the Kern County Valley Floor Habitat Conservation Plan and associated BLM Programmatic Section 7 Consultation on oil and gas development activities will provide adequate protection for resources identified in b, c, and d above for lands within CDOG administrative boundaries and for all federally reserved mineral estate in Kern County. Future lease sales covering parcels in those areas would defer the addition of a Limited Use Stipulation to notation that compliance with the above approved programs or plans is required.

Controlled Surface Use Stipulation - Federally Proposed and Listed Species (CSU - Protected Species)

All or a portion of this lease is within the range of one or more plant or animal species (a list of species would be included with the stipulation for each lease) that are either listed as threatened or endangered, or are proposed for such listing by the U.S. Fish and Wildlife Service.

The lessee is notified that time frames for processing applications may be delayed beyond established standards to allow for species surveys, and consultation or conferencing with the U.S. Fish and Wildlife Service. Notice is also given that surface-disturbing activities may be moved or modified, and that some activities may be prohibited during seasonal time periods. Surface disturbing activities will be prohibited on the lease only where:
the proposed action is likely to jeopardize the continued existence of a listed or proposed species, or
the proposed action is inconsistent with the recovery needs of a listed species as identified in an approved U.S. Fish and Wildlife Service Recovery Plan.

Prior to the authorization of any surface disturbing activities, a preliminary environmental review will be conducted to identify the potential presence of habitat for these species. Authorizations may be delayed until completion of the necessary surveys during the appropriate time period for these species. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year.

The BLM may need to initiate consultation or conference with the U.S. Fish and Wildlife Service if the site inspection concludes that a listed or proposed species may be affected by the proposed activity. The lessee should be aware that the U.S. Fish and Wildlife Service has up to 135 days to render their biological opinion, and that there are provisions for an additional 60 day extension. Offsite habitat protection or enhancement for wildlife or vegetation (compensation) may be required by the U.S. Fish and Wildlife Service when habitat is disturbed. The consultation may also result in some restrictions to the lessee's plan of development, including movement or modification of activities, and seasonal restrictions. Surface disturbing activities will be prohibited on the lease if the consultation or conference concludes that either of the conditions identified in 1. or 2. above exists.

Additional Information

Application. The Controlled Surface Use - Federally Proposed and Listed Species (LSU - Protected Species) stipulation would be attached, at the time of lease sale, to leases within the range of certain federally listed or proposed species, or to leases containing, or adjacent to, documented locations of certain federally listed or proposed species. (A list of species would be included with the stipulation for each lease.)

See BLM Biology Tables 4 and 6 for the Federally Proposed and Listed Species in the Bakersfield Field Office.

Documented locations for currently proposed species will be used to determine current applicability of the LSU - Protected Species stipulation for proposed species. If additional species become proposed, or new location information becomes available, the species and parcel lists will be modified and all subsequent lease sales will be evaluated against the modified parcel list.

Review Process. Generally, the following process will be used to approve surface disturbing activities on leases with the LSU - Protected Species stipulation. The proposed activity would be reviewed to

determine if listed or proposed species would be affected. This review may involve site-specific surveys for plant and animal species, conducted according to established methodologies that may specify certain seasons or other conditions. In some cases, this may mean that a survey cannot be completed until the next growing season for some plant species or after seasonal appearance for some animal species. If the review determines that listed or proposed species will not be affected, approval of the application will normally be granted within 30 days of the review.

If the review determines that listed or proposed species may be affected, but in a beneficial, insignificant or benign manner, and written concurrence is received from the U.S. Fish and Wildlife Service, approval of the application will normally be granted within 30 days of receiving U.S. Fish and Wildlife Service concurrence.

If it is determined that a listed or proposed species may be adversely affected, the BLM will work with the applicant to modify the proposal to minimize impacts. Modifications may include movement of activities, seasonal restrictions, mitigation and/or compensation. Modified proposals will be developed cooperatively with the applicant to ensure that the modified project still meets the applicant's objective. If the modified project may still adversely affect a listed or proposed species, BLM will initiate formal consultation or conference with the U.S. Fish and Wildlife Service.

Coordination with the U.S. Fish and Wildlife Service on Listed Species. Currently there are two options for meeting the formal consultation requirement. A new consultation may be initiated or a previously completed formal consultation may be utilized.

If a new consultation is initiated, the U.S. Fish and Wildlife Service will issue a document, called the Biological Opinion. The U.S. Fish and Wildlife Service has up to 135 days to complete a Biological Opinion and they may request an additional 60-day extension. Extensions beyond 195 days require the consent of any applicant.

A previously completed formal consultation may also be used to meet the formal consultation requirement. An example of a previously completed consultation that may be used is the San Joaquin Valley Oil and Gas Programmatic Biological Opinion.

Upon completion of a new consultation or determination that a previously completed consultation can be used, approval of the application will normally be granted within 30 days. If the new consultation concludes that a listed species may be jeopardized, then surface disturbance will be prohibited on the lease. Surface disturbance will also be prohibited if the consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved U.S. Fish and Wildlife Service Recovery Plan.

Coordination with the U.S. Fish and Wildlife Service on Proposed Species. Bureau policy requires a conferencing with the U.S. Fish and Wildlife Service on any action that may adversely affect proposed species. Depending on the complexity of the situation, a conference may be completed in a single telephone conversation or may require the time frames of a consultation. Generally, upon completion of the conference, approval of the application will be granted within 30 days. If the conference concludes that a proposed species may be jeopardized, surface-disturbing activities will be prohibited on the lease.

Final Approval. Final approval of applications that will have no effect on listed or proposed species will normally be granted within 30 days of the review.

Final approval for projects that may affect listed or proposed species in a beneficial, insignificant or benign manner will normally be granted within 30 days of receiving U.S. Fish and Wildlife Service

written concurrence. The U.S. Fish and Wildlife Service generally responds to requests for concurrence in 30 days.

For projects that require consultation or conference with the U.S. Fish and Wildlife Service, final approval will normally be granted within 30 days of consultation or conference completion. Conditions of approval will include any conditions specified by the BLM or U.S. Fish and Wildlife Service for minimizing impacts.

Controlled Surface Use - Federal Candidate, State Listed and Bureau Sensitive Species (CSU - Sensitive Species)

All or a portion of this lease is within the range of one or more plant or animal species (see attached list) that are either Federal candidates for listing as threatened or endangered (Federal Candidate), are listed by the State of California as threatened or endangered (State Listed), or are designated by the Bureau of Land Management as Sensitive (Bureau Sensitive).

The lessee is notified that time frames for processing applications may be delayed beyond established standards to allow for species surveys and coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Game. Notice is also given that surface-disturbing activities may be relocated beyond the standard 200 meters but not more than 1/4 mile and that surface disturbing activities may be prohibited during seasonal time periods.

Prior to the authorization of any surface disturbing activities, a preliminary environmental review will be conducted to identify the potential presence of habitat for these species. Authorizations may be delayed until completion of the necessary surveys during the appropriate time period for these species. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year.

The Bureau of Land Management may need to coordinate with the U.S. Fish and Wildlife Service or the California Department of Fish and Game if the site inspection concludes that a Federal Candidate, State Listed or Bureau Sensitive species may be affected by the proposed activity. Coordination may delay application processing beyond established time frames.

To prevent or reduce disturbance to Federal Candidate, State Listed or Bureau Sensitive species, surface operations may be moved up to 1/4 mile and surface disturbing activities may be prohibited during seasonal time periods.

Additional Information

The Limited Use - Federal Candidate, State Listed and Bureau Sensitive Species (LSU - Sensitive Species) stipulation would be attached to leases that are either within the range of certain species, or that contain or are adjacent to a documented location of a certain species. A list of species would be included with the stipulation for each lease.

See Biology Tables 4, 5, 7 for the Federal Candidate, State Listed and BLM Sensitive Species within the Bakersfield Field Office.

The current list of parcels or potential geographic area for each species will be maintained in the Bakersfield Field Office. As species are added or removed from special designation, or new location information becomes available, the species list, parcel lists and geographic area lists will be modified. All

subsequent lease auctions will be evaluated against the modified species list, parcel list or geographic area list.

Generally the following process will be used to approve surface disturbing activities on leases with the LSU - Sensitive Species stipulation. The proposed activity would be reviewed to determine if special status species would be affected. This review may involve site-specific surveys for plant and animal species, conducted according to established methodologies that may specify certain seasons or other conditions. In some cases this may mean that a survey cannot be completed until the next growing season for some plants or after seasonal appearance for some animal species.

If the review determines that a special status species may be adversely affected, then surface disturbing activities may be relocated up to 1/4 mile and certain surface disturbing activities may be prohibited during seasonal periods. Bureau policy may also require coordination with the U.S. Fish and Wildlife Service or California Department of Fish and Game.

Controlled Surface Use Stipulation - Proposed Critical Habitat and Designated Critical Habitat (CSU - Critical Habitat)

Although there is not currently any Proposed or Designated Critical Habitat within the areas that are identified for lease in this sale, should Proposed or Critical Habitat be designated within these lands in the future, the following stipulation would apply:

All or a portion of this lease lies within an area that is designated as critical habitat, or is proposed for designation as critical habitat (see attached species and parcel list) by the U.S. Fish and Wildlife Service.

The lessee is notified that time frames for processing applications may be delayed beyond established standards to allow for species surveys, and consultation or conferencing with the U.S. Fish and Wildlife Service. Notice is also given that surface disturbing activities may be moved or modified and that some activities may be prohibited during seasonal time periods. Surface disturbing activities will be prohibited on the lease only where:

1. the proposed action is likely to destroy or adversely modify critical habitat or proposed critical habitat, or
2. the proposed action is inconsistent with the recovery needs of a listed species as identified in an approved U.S. Fish and Wildlife Service Recovery Plan.

Prior to the authorization of any surface disturbing activities, a preliminary environmental review will be conducted to identify the potential presence of habitat for these species. Authorizations may be delayed until completion of the necessary surveys during the appropriate time period for these species. The lessee should be aware that the timing of the surveys is critical, in that some species can only be surveyed during a brief period each year.

The Bureau of Land Management may need to initiate consultation or conference with the U.S. Fish and Wildlife Service if the site inspection concludes that designated or proposed critical habitat may be affected by the proposed activity. The lessee should be aware that the U.S. Fish and Wildlife Service has up to 135 days to render their biological opinion, and that there are provisions for an additional 60 day extension. Offsite habitat protection or enhancement for wildlife or vegetation (compensation) may be required by the U.S. Fish and Wildlife Service when designated or proposed critical habitat is disturbed. The consultation may also result in some restrictions to the lessee's plan of development, including

movement or modification of activities, and seasonal restrictions. Surface disturbing activities will be prohibited on the lease only if the consultation or conference concludes that either of the conditions identified in 1. or 2. above exist.

Additional Information

Application. The Controlled Surface Use - Designated and Proposed Critical Habitat (LSU - Critical Habitat) stipulation would be attached to leases within areas that are designated as critical habitat, or proposed for designation as critical habitat for certain species. A list of species and parcels would be included with the stipulation for each lease. Critical habitat is designated or proposed by the U.S. Fish and Wildlife Service according to the regulations found in 50 CFR 424. Critical habitat means (1) the specific areas within geographical area currently occupied by a species, at the time it is listed in accordance with the Endangered Species Act, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary that such areas are essential for conservation of the species (50 CFR 424.02).

There is currently no designated or proposed critical habitat, or else the constituent elements do not exist, within the parcels covered by this EA. Consequently, no critical habitat would be affected by leasing and developing these parcels and none of the parcels would have this stipulation. If additional areas are designated within these parcels, future permit approvals would be evaluated using those criteria as appropriate.

Review Process. Generally, the following process will be used to approve surface disturbing activities on leases with the CSU - Critical Habitat stipulation. The proposed activity would be reviewed to determine if designated or proposed critical habitat would be affected. This review may involve site specific surveys for plant and animal species, conducted according to established methodologies which may specify certain seasons or other conditions. In some cases this may mean that a survey cannot be completed until the next growing season for some plant species or after seasonal appearance for some animal species.

If the review determines that listed or proposed critical habitat will not be affected, approval of the application will normally be granted within 30 days of the review.

If the review determines that listed or proposed critical habitat may be affected, but in a beneficial, insignificant or benign manner, and written concurrence is received from the U.S. Fish and Wildlife Service, approval of the application will normally be granted within 30 days of receiving U.S. Fish and Wildlife Service concurrence.

If it is determined that a listed or proposed critical habitat may be adversely affected, the BLM will work with the applicant to modify the proposal to minimize impacts. Modifications may include movement of activities, seasonal restrictions, mitigation and compensation. Modified proposals will be developed cooperatively with the applicant to ensure that the modified project still meets the applicant's objective. If the modified project may still adversely affect designated or proposed critical habitat, BLM will initiate formal consultation or conference with the U.S. Fish and Wildlife Service.

Coordination with the U.S. Fish and Wildlife Service on Designated Critical Habitat. The BLM is required to initiate formal consultation with the U.S. Fish and Wildlife Service for any action that may adversely affect designated critical habitat. As a result of the consultation, the U.S. Fish and Wildlife Service issues a document, called the Biological Opinion. The U.S. Fish and Wildlife Service has up to

135 days to complete a Biological Opinion and they may request an additional 60 day extension. Extensions beyond 195 days require the consent of any applicant.

As part of the Biological Opinion, the U.S. Fish and Wildlife Service will determine if the proposed action is likely to destroy or adversely modify critical habitat. Destruction or adverse modification of critical habitat means a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (50 CFR 402.02).

If consultation concludes that critical habitat will be destroyed or adversely modified, then surface disturbance will be prohibited on the affected portion of the lease. Surface disturbance will also be prohibited if the consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved U.S. Fish and Wildlife Service Recovery Plan. Coordination with the U.S. Fish and Wildlife Service on Proposed Critical Habitat. Bureau policy requires conferencing with the U.S. Fish and Wildlife Service on any action that may adversely affect proposed critical habitat. Depending on the complexity of the situation, a conference may be completed in a single telephone conversation or may require the time frames of a consultation. Generally, upon completion of the conference, approval of the application will be granted within 30 days. If the conference concludes that proposed critical habitat will be destroyed or adversely modified, then surface disturbance will be prohibited on the affected portion of the lease.

Final Approval. Final approval of applications that will have no effect on designated or proposed critical habitat will normally be granted within 30 days of the review.

Final approval for projects that may affect designated or proposed critical habitat in a beneficial, insignificant or benign manner will normally be granted within 30 days of receiving U.S. Fish and Wildlife Service written concurrence. The U.S. Fish and Wildlife Service generally responds to requests for concurrence in 30 days.

For projects that require consultation or conference with the U.S. Fish and Wildlife Service, final approval will normally be granted within 30 days of consultation or conference completion. Conditions of approval will include any conditions specified by the BLM or U.S. Fish and Wildlife Service for minimizing impacts.

Controlled Surface Use - Raptor (CSU - Raptor) – N/A

Department of Defense lands (CSU – Defense) – N/A

Coast Management Area (CSU – Coast, for management of Coast Area ACEC's/SMA's) – N/A

Standard Engineering Practices

Recognized engineering practices for the routine operation of oil and gas exploration and development are known as Conditions of Approval or COAs. These standard procedures are described in the Federal Onshore Orders and further clarified in the Code of Federal Regulations (CFR 43, October, 2005).

Standard regulations may be supplemented with additional COAs. The additional COAs address sensitive issues within the Area managed by the Bakersfield Field Office. Critical issues underlying the federal regulations and supplemental COAs are the protection of usable aquifers, mineral zones including hydrocarbons, surface environmental issues, site safety and well control, and site reclamation.

Bureau inspection and monitoring of oil field activity on public lands is discussed within the phases of oil and gas development:

Drilling a New Well
Temporary Abandonment of a Producing Well (Idle Well)

Plugging and Abandonment of a Well

Surface Reclamation

No special COAs are normally added for routine producing operations.

Drilling a New Well

After an Application for Permit to Drill (APD) has been received by the Bakersfield Office of the Bureau of Land Management, a review of engineering design as well as potential effects to sensitive resources is undertaken. Special conditions would be noted on the application at this review stage of an oil and gas project by either the operator or the Bureau of Land Management. Modified proposals would be developed cooperatively with the applicant to ensure that the modified project still meets the applicant's objective. Any special conditions would be attached to the APD by the Bureau and the applicant would be informed within seven days of receipt of the APD. In addition to Bureau-wide regulations, the Bakersfield Field Office has developed procedures - these may include but are not limited to:
Steam Injectors. All steam injection wells within a 300' radius of a new location must be shut-in a minimum of 3 days prior to the spudding of a new well.

Conductor Pipe. A minimum of 50' of conductor pipe is to be set and cemented to surface. The conductor pipe must be equivalent to or exceed the properties of A-25 grade line pipe.

Diverter. Prior to spud, a diverter system will be installed on the conductor pipe and function tested. The test will be recorded in the drilling log. The diverter system, at a minimum, will consist of an annular type preventer (minimum working pressure 1000 psi); 2" (minimum ID) kill line, and 6" (minimum ID) diverter line with no internal restrictions or turns. A full opening hydraulically-controlled valve will be installed in the diverter line which will automatically open when the annular preventer is closed. The accumulator system will have sufficient capacity to close the annular preventer and open the hydraulically-controlled valve.

Remote controls for the diverter system will be located on the rig floor and readily accessible to the driller. Remote controls will be capable of closing the annular preventer and opening the hydraulically-controlled valve. Master controls will be located at the accumulator and will be capable of closing and opening the annular preventer and opening the hydraulically-controlled valve. The diverter system will be function-tested daily and the test recorded in the drilling log.

General Casing and Cementing. A Subsequent Report (Form 3160-5) detailing the size, weight, and grade of the casing; the amount and type of cement, including additives; and a copy of the service company's materials ticket and job log will be submitted to the BLM within five (5) business days following the cementing of the casing string. Each casing string (except conductor pipe) will be pressure

tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1000 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing. The casing pressure test will be recorded in the drilling log. The wait-on-cement (WOC) time for each casing string will be adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

Drilling Fluids. Sufficient quantities of drilling fluid (mud and water) will be maintained at the well site, at all times, for the purpose of controlling steam kicks.

Temporary Abandonment of a Producing Well (Idle Well)

Economic conditions often depress the California market for the typical heavy oil produced in the area managed by the Bakersfield Field Office. When the producing market is depressed, an operator may decide to shut-in his uneconomic, producing wells and wait for conditions to improve. The highly viscous nature of most Kern County crude oil, typical low well head pressures, and the relatively low corrosive properties of the fluids (low sulfur crude) make the known dangers of shutting in a well for long periods and then bringing it back on-line less of a mechanical problem here in this Field Office Area than in other producing regions of the country. As a result, by 1990, a large number of wells were remaining idle for longer and longer periods. Monitoring and correction of the problem have been successfully undertaken by the California Division of Oil, Gas, and Geothermal Resources and the local BLM Field Office. The following additional conditions *may* be required as applicable prior to the temporary abandonment (TA) of a producing oil/gas well, service well, or an injection well.

Zone Isolation. The requirement to isolate the producing interval (General Requirement #4) is waived. This waiver is based on the information submitted with the application and the geologic data in Volume # 1 California Oil and Gas Fields, Central California, (Buena Vista Oil field) which indicates the absence of usable water aquifers above the producing horizon in (section in which well is located).

Mechanical Integrity of Casing. The mechanical integrity of the casing may be determined using the ADA pressure test method.
Fluid Surveys. A fluid level survey will be performed at 2-5 year intervals during the period the well is temporarily abandoned. A copy of the survey will be submitted to the BLM with the TA well request (sundry notice form 3160-5).

Monitoring of Wellhead Pressures and Temperatures. Wellhead pressure and temperature will be continuously monitored throughout the period the well is temporarily abandoned. Any pressure/temperature change will be promptly reported to the BLM.

Isolation of the Producing Interval. The producing interval will be isolated by setting a plug in the casing within 100' above the producing interval if a rising fluid level, an increasing wellhead pressure, or an increasing wellhead temperature is detected. The plug can be either a retrievable or drillable-type bridge plug or a cement plug of at least 100' in length.

Plugging and Abandonment of a Well

No additional conditions are typically attached to the abandonment of a well in California. Onshore Orders describe the plugging procedure. While final abandonment will normally be witnessed by the BLM, no final site marker is currently required by the Bakersfield field office.

Surface Reclamation

Conditions for the recovery of an oil well site are unique to each area's ecosystem and habitat. The following examples of Conditions of Approval have been developed for use within the Area managed by the Bakersfield Field Office. The applicability of any or all of these COAs will be determined based on site-specific conditions.

General. The operator (or holder) will prepare a seedbed by: a) scarifying the disturbed area, (b) distributing topsoil uniformly, or c) disking the topsoil, as directed by the BLM Authorized Officer (use one as appropriate).

The operator will recontour the disturbed area and obliterate all earthwork by removing embankments, backfilling excavations, and grading to re-establish the approximate original contours of the land in the area of operation.

The operator will uniformly spread topsoil over all unoccupied disturbed area (outside the ditch line, fence line, and work area). Spreading will not be done when the ground or topsoil is frozen or wet. The operator will seed all disturbed area, using an agreed upon method suitable for the location. Seeding will be repeated if a satisfactory stand is not obtained as determined by the BLM Authorized Officer upon evaluation after the first growing season.

The operator will arrange to have a biologist available to assist the construction workers in the identification and avoidance of endangered species.

Producing Wells. Site reclamation for producing wells will be accomplished for portions of the site not required for continued operation of the well. The following measures are typical reclamation requirements, and any or all of these may be required on a site by site basis:

Reclamation of drilling fluid pit (mud pit). Polluting substances, contaminated materials moved offsite or buried.

Site fencing.
Berm removal and site grading.
Cut and fill slope vegetation.

Non-producing Wells. Rehabilitation on the entire site will be required and will commence as soon as practical, dependent upon prevailing weather conditions. Cut and fill slopes will be reduced and graded to blend to the adjacent terrain.

Drilling fluids held within pits may be allowed to dry. Fluids that will not dry must be removed. All polluting substances or contaminated materials such as oil, oil-saturated soils, and gravels will be buried with a minimum of 2 feet of clean soil as cover, or be removed to an approved site.

Drainages will be re-established and temporary measures will be required to prevent erosion to the site until vegetation is established.

After final grading and before replacement of topsoil, the entire surface of the site will be scarified to eliminate slippage surfaces and to promote root penetration. Topsoil will then be spread over the site to achieve an approximate uniform, stable thickness consistent with the established contours.

Permanent Well Abandonment. The surface management agency is responsible for establishing and approving methods for surface rehabilitation and determining when this rehabilitation has been satisfactorily accomplished. At this point, a Subsequent (Final) Report of Abandonment will be approved.

APPENDIX D – Oil & Gas Activity on Leases from Recent Lease Sales Conducted within the Past 10 Years (10-01-2001 through 09-30-2011)

CASE NUMBER	Lease Issue Date	OPERATOR	WELLNo.	WELL NAME	TWP	RGE	SEC	QTR SME	SPUDDED	*STATUS AS OF 10-01-2011	**Notice of First Prod Rec'd	Wildcat ?	Total New Disturbance (acres)	Compensation Land Purchased (acres)
CACA43779	02/01/02	VENOCO	1-33	BLM	31S	22E	33		07/20/2011	DRLG		Yes	0.5	2.0
CACA43779 Count			1								no			
CACA43782	02/01/2002	OCCIDENTAL ELK HILLS INC	374X-6R		30S	23E	6	SENE BLM	06/29/2004	P+A		Yes	1.0	1.1
CACA43782 Count			1								no			
CACA44917	02/01/2003	HATHAWAY	1-20		27	27	20	SENE FEE	03/20/2011	POW			0	
CACA44917	02/01/2003	HATHAWAY	2-20	Hathaway USL	27	27	20	SWNE FEE	09/03/11	DRLG				
CACA44917 Count			1								yes			
CACA44937	10/18/02	E & B EXPLORATION	16x-34	USL	1N	20W	34		02/11/10	P+A		Yes	1.86	5.58
CACA44937 Count			1								no			
CACA45939 (Unit CACA51616X)	02/25/04	VENOCO	1-29	BLM	31S	22E	29		02/14/10	P+A		yes	1.77	5.54
CACA45939 (Unit CACA51616X)	02/25/04	VENOCO	1-29RD	BLM	31S	22E	29			DRLG		yes	0	
CACA45939 Count			2								yes			
CACA46601	12/30/2004	NAFTEX OPER. CO	1-3	USL	29S	29E	26	NWNW FEE	03/4/2007	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-4	USL	29S	29E	26	SWNW FEE	03/7/2007	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-4B	USL	29S	29E	26	SWNW FEE	07/3/2008	POW		No		
CACA46601	12/30/2004	NAFTEX OPER.	1-3B	USL	29S	29E	26	SWNW	07/7/2008	POW		No	13.26	38.45

CASE NUMBER	Lease Issue Date	OPERATOR	WELLNo.	WELL NAME	TWP	RGE	SEC	QTR SME	SPUDDED	*STATUS AS OF 10-01-2011	**Notice of First Prod Rec'd	Wildcat ?	Total New Disturbance (acres)	Compensation Land Purchased (acres)
		CO						FEE						
CACA46601	12/30/2004	NAFTEX OPER. CO	1-6	USL	29S	29E	26		06/5/2010	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-4	USL	29S	29E	26	SWNW FEE	07/10/2008	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-6	USL	29S	29E	26	SWNW FEE	07/14/2008	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	3-5	USL	29S	29E	26	SWNW FEE	07/16/2008	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	4-5	USL	29S	29E	26	SENW FEE	07/19/2008	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-5	USL	29S	29E	26	SWNW FEE	03/31/2009	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-4B	USL	29S	29E	26	SWNW FEE	04/3/2009	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-3	USL	29S	29E	26	NWNW FEE	4/5/2009	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-3B	USL	29S	29E	26	SWNW FEE	06/24/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	3-3B	USL	29S	29E	26	SWNW FEE	06/28/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	4-5B	USL	29S	29E	26	SENW FEE	07/1/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-5	USL	29S	29E	26	SWNW FEE	11/10/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	3-5B	USL	29S	29E	26	SWNW FEE	11/14/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-5B	USL	29S	29E	26	SWNW FEE	11/14/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	2-5B	USL	29S	29E	26	SWNW FEE	11/16/09	POW		No		
CACA46601	21/30/2004	NAFTEX OPER. CO	3-4	USL	29S	29E	26		11/23/09	POW		No		
CACA46601	12/30/2004	NAFTEX OPER.	3-6	USL	29S	29E	26	SWNW	11/19/09	POW		No		

CASE NUMBER	Lease Issue Date	OPERATOR	WELLNo.	WELL NAME	TWP	RGE	SEC	QTR SME	SPUDDED	*STATUS AS OF 10-01-2011	**Notice of First Prod Rec'd	Wildcat ?	Total New Disturbance (acres)	Compensation Land Purchased (acres)
		CO						FEE						
CACA46601	12/30/2004	NAFTEX OPER. CO	3-4B	USL	29S	29E	26	SENW	05/30/10	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	4-3	USL	29S	29E	26	NENW	05/27/10	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	5-6	USL	29S	29E	26	SENW	05/24/10	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	4-6	USL	29S	29E	26	SENW	05/15/10	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-2B	USL	29S	29E	26	NWNW	06/2/10	POW		No		
CACA46601	12/30/2004	NAFTEX OPER. CO	1-2	USL	29S	29E	26	NWNW	06/8/10	POW		No		
CACA46601 Count			27								yes			
CACA47598	07/18/2006	NATIONS PETROLEUM USA LTD	E-G15	USL	25S	20E	33	SWNE BLM	12/15/2007	DRG		No		
CACA47598	07/18/2006	NATIONS PETROLEUM USA LTD	E-M20	USL	25S	20E	33	SWNE BLM	12/17/2007	DRG		No	2.0	5.98
CACA47598 Count			2								no			
CACA47611	07/20/2006	SOLIMAR ENERGY LLC	6	WELLINGTON-MARI	11N	23W	8	SESE FEE	03/16/2008	POW		No		
CACA47611	07/20/2006	SOLIMAR ENERGY LLC	7	WELLINGTON-MARI	11N	23W	8	SESE FEE	08/28/2008	POW		No	1.6	2.9
CACA47611 Count			2								yes			
CACA48007	07/18/2006	PLAINS EXPL & PROD CO LP	340M	USL 34Z WEST	30S	22E	34	SWSW BLM	08/7/2007	POW		No		
CACA48007	07/18/2006	PLAINS EXPL & PROD CO LP	338M	USL 34Z WEST	30S	22E	34	SESE BLM	08/8/2007	POW		No	1.86	7.32
CACA48007 Count			2								yes			
CACA49192	09/27/2007	OCCIDENTAL ELK HILLS INC	581X-22Z		30S	22E	22	NENE BLM	12/7/2007	POW		No	5.0	14.7

CASE NUMBER	Lease Issue Date	OPERATOR	WELLNo.	WELL NAME	TWP	RGE	SEC	QTR SME	SPUDDED	*STATUS AS OF 10-01-2011	**Notice of First Prod Rec'd	Wildcat ?	Total New Disturbance (acres)	Compensation Land Purchased (acres)
CACA49192	09/27/2007	OCCIDENTAL ELK HILLS INC	371X-22Z		30S	22E	22	NENE BLM	07/13/2008	POW		No		
CACA49192 Count			2								yes			
CACA49625 (Unit CACA51616X)	02/26/2010	VENOCO	1-19	BLM	31S	22E	19		08/30/2011	DRLG			1.38	5.5
CACA49625 Count														
CACA50418	01/01/03	CARNEROS/ VINTAGE	27-15	USL					04/23/2004	TA		yes	0	
CACA50418 Count			1								no			
Grand Count			**43**										**30**	**102.17**
*All wells are included, but the current status may be outdated because records have not been received from the operator. ** Notice of first production rec'd means that at least one well on the lease was successful.														
For the 03-2012 lease sale analysis: A total of 43 wells have been drilled on leases issued from lease sales after 10-01-2001, 10 years prior to the date of this analysis (10-01-2011). A total of 12 leases have had at least one well. Eleven leases have had 1-2 wells and 1 lease had 27 wells. Five leases have had at least 1 successful well, three leases have not, and three have wells currently drilling. A total of 9 lease sales conducted in 2000, 2002, 2003, 2004, 2006, 2007, and 2010 had at least one lease that had drilling. Of those, 3 years had a sale with at least one successful well drilled, and 4 years had no leases with any successful drilling (including a couple of years with wells still in drllling status. Total disturbance of 32 acres for all 43 wells (plus other disturbance) = avg. of <1 acre per well.														

APPENDIX E - Air Emissions Calculations

For the purpose of this exercise, there are a number of assumptions. First, as a maximum, it is assumed that the emission numbers in the above table are for wells alone and not for all of the other equipment and sources previously described. In making this assumption, BLM is conceding that these estimates are above actual individual well emission factors, and the numbers calculated are higher than actual emission factors that would be found if the appropriate data were available. We are also using a 45,000 oil and gas well estimate gathered from the California Division of Oil and Gas (www.consrv.ca.gov/DOG) for the number of total oil and gas wells in the San Joaquin Valley. Furthermore, we are using the values for Kern County, CDOGGR District 4, and the San Joaquin Valley APCD in analyzing the environmental effects related to air quality under this EA. This is necessary because the data are not available on an individual field or well by well basis. This will not cause a statistically significant error because all of the parcels are in Kern County.

An emission formula and emission factor was provided by Air Quality Engineer Leonard Scandura of the SJVAPCD. The formula is E = A x EF where E= emissions, A= activity or source, and EF is the constant emission factor. Using a derivative of the E= A x EF formula and the Estimated Statewide Annual Emissions from Oil and Gas Production, 2006, the emission calculations for VOCs, NOx, SOx, PM10 and PM 2.5 for one well are included below.

The emission calculation for VOCs is as follows:

74.19 tons VOCs/day = 148,380 lbs VOCs/day
EF = E/A
EF = 148,380 lbs VOCs/day / 45,000 total wells = 3.30 lbs VOCs /day/well
3.30 lbs VOCs/day/well x 365 days/year = 1,204.5 lbs VOCs/year/well
This is 0.002% (3.30 lbs/day/well / 148,380 lbs VOCs/day) of the total oil and gas production emissions for VOCs, and below the de minimis level for VOCs.
The emission calculation for NOx is as follows:
23.16 tons NOx/day = 46,320 lbs NOx/day
EF = E/A
EF = 46,320 lbs NOx/day / 45,000 total wells = 1.03 lbs NOx/day/well
1.03 lbs NOx/day/well x 365 days/year = 375.7lbs NOx/year/well
This is 0.002% (1.03 lbs/day / 46,320 lbs NOx/day) of the total oil and gas production emissions for NOx, and below the *de minimis* level for NOx of 10 tons/year/stationary source.
The emission calculations for SOx are as follows:
2.23 tons SOx/day = 4,460 lbs SOx/day
EF = E/A
EF = 4,460 lbs SOx/day / 45,000 total wells = 0.10 lbs SOx/day/well

0.10 lbs SOx/day/well x 365 days/year = 36.5 lbs SOx/year/well
This is 0.002% (0.10 lbs/day / 4,460 lbs SOx/day) of the total oil and gas production emissions for SOx, which is below the *de minimis* level for SOx of 10 tons/year/stationary source.
The emission calculations for PM10 are as follows:
1.82 tons PM10/day = 3,640 lbs PM10/day
EF = E/A
EF = 3,640 lbs PM10/day / 45,000 total wells = 0.081 lbs PM10/day/well

0.081 lbs PM10/day/well x 365 days/year = 29.565 lbs PM10/year/well

This is 0.002% (0.081 lbs/day / 3,640 lbs PM10/day) of the total oil and gas production emissions for PM10, which is below the *de minimis* level for PM10 of 15 tons/year/stationary source.
The emission calculations for PM2.5 are as follows:
1.87 tons PM2.5/day = 3,740 lbs PM2.5/day
EF = E/A
EF = 3,740 lbs PM2.5/day / 45,000 total wells = 0.083 lbs PM2.5/day/well

0.083 lbs PM2.5/day x 365 days/year = 30.30 lbs PM2.5/year/well

This is 0.002% (0.083 lbs/day / 3,740 lbs PM10/day) of the total oil and gas production emissions for PM2.5, which is below the *de minimis* level for PM2.5 of 15 tons/year/stationary source.